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CHINESE FARM ECONOMY

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A study of 2866 farms in seventeen localities and seven provinces in China

BY

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FOREWORD

THE University of Nanking is pleased to be able to present within this volume the results of the studies in rural economy in China made by the Department of Agricultural Economics, Farm Management and Rural Sociology, under the direction of Professor Buck, which are the first of their kind in this country. The value of this work has been most generously recognized by the Institute of Pacific Relations, through the recommendation of their China Council, in funds which have made possible its publication in this from. It is with much gratification that this gift is acknowledged. Such cooperation is of importance not only in the particular aspects of one university, but in far more widespread meaning, namely, that of international understanding and of mutual and constructive study of the countries of the world. In this larger sense, also, we are glad to be cooperators.

Y. G. CHEN, *President*
The University of Nanking, Nanking, China.

21672

The *Book of Filial Piety* gives these requirements of a good farmer:

Work according to seasons,
Suit crops to soils for profit,
Guard behavior, spend wisely,
Nurture parents with honor.

PERFACE

THIS study of farm management and rural social conditions on 2866 farms in seventeen localities of China is the outgrowth of a desire for systematic knowledge of Chinese farming. It was begun with the purpose of giving students practical experience in the collection of data and with the hope of obtaining material for teaching purposes. After the first studies were completed, the possible usefulness of the information for students of agricultural and social conditions abroad, as well as in China, became apparent, and gradually the scope of the data increased until it included a fair number of farms in China, infinitesimal as compared with the total, but representative of the widely separated seventeen localities. The study includes a farm area of 8500 hectares or 21,000 acres, the capital investment is nearly $5,000,000 Chinese currency, and the rural population approximates 17,000 persons.

While this book is not planned for the general reader, it is intended, nevertheless, to be such that anyone can follow the text without difficulty; meanwhile, it is hoped the technician will find the tables useful as source material for additional interpretation, since it has been impossible in this one volume to interpret all aspects of their contents. For convenience in arrangement, the tables have been kept with the subject matter of each chapter rather than put into the appendix; thus data pertaining to a single subject have not been separated.

Acknowledgments are made first of all to the students and other field investigators, whose names appear in table I, and to the 2866 farmers, who cooperated to the extent of giving the desired information. In the tedious work of analysis special mention must be made of P. H. Hwa, who aided in the finding of suitable clerical assistants in the first years of the work: of W. Y. Swen, who rendered much help in the direction and supervision of the assistants; of C. M. Chiao, who has not only assisted, but contributed to the method of analysis of the

chapters on Farm Ownership and Tenancy, The Farm Family and Population, the Standard of Living and Food Consumption; of H. C. Li, a very careful and accurate clerical assistant, who aided in apportioning the work among the assistants, but who died in the midst of the work, leaving a place difficult to fill; of S. L. Ling, who has so efficiently taken up the work left by H. C. Li; of P. K. Chen, who besides the work of analysis, has so carefully drawn all the charts; of T. L. Hsu, for his special assistance in the biometric analysis and of R. H. Fang and S. F. Yang, who, like those already mentioned, have assisted from the beginning to the completion of the work; of L. L. Chang for his careful proof reading; of Miss G. C. Mertsky particularly for compiling the index; and of all others who have helped for briefer periods of time. For editing I am greatly indebted to my wife.

Grateful acknowledgment is given to the Bureau of Plant Industry of the United States Department of Agriculture for the use of certain photographs taken by C. A. Reed, illustrations 1, 6, 11-15, 17, 26, and 30; to Mr. Guy Thelin for illustrations 2, 3, 27, and 28; and to G. E. Ritchey for illustrations 18 and 19. The other photographs are by the author.

A number of persons have read parts of the work either in manuscript or in proof form and their suggestions have been most welcome. Special mention must be made of Dr. G. F. Warren's help in reading those chapters pertaining more particularly to the farm management aspects of the study.

Much apprecation is due Dr. J. B. Condliffe, Director of Research of the Institute of Pacific Relations, whose keen interest in all economic research led him to present the manuscript of this book to the China Council of the Institute of Pacific Relations.

JOHN LOSSING BUCK.

July 1, 1930
Nanking, China

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CHAPTER I

INTRODUCTION

METHOD AND SCOPE OF STUDY

The method used in the collection of all data was the *survey method,* in which the inclusion of a large number of farms offsets the disadvantage of no written records. It is, in fact, almost the only practicable method where there is such a large percentage of illiteracy as among Chinese farmers, who rarely keep written accounts. These farmers remember quite clearly, however, the details of their previous year's business, since each detail is a more or less important part of their daily life. The errors attendant upon the survey method are relatively small, provided the sample is representative, bias is eliminated or accounted for, and provided the number of records is large enough. The chances of a farmer's estimating too high or too low are equal and the average of such answers undoubtedly represents conditions more nearly than would information obtained from a limited number of written records, even if that were possible.

No claim is made for accuracy to the exact cent of original data; such accuracy is unnecessary for the understanding of the farm business. If criticism on the grounds of inaccuracy, however, be made, of these studies, especially by those unfamiliar with the survey method, it may be said that the real question is not accuracy in a bookkeeping sense, but whether or not the data correctly interpret the essential characteristics of the farm business. There are imperfections and disadvantages in any method, but where the survey method has been used in China it has proved practical for obtaining a good understanding of the farm business in China. To those readers who are unfamiliar with the survey method, the publications by Warren (1) and Spillman (2) on methods of making agricultural surveys are commended.

It is not easy to obtain relatively accurate data in China but it is not impossible, and only those who are inexperienced

(1) References are cited at the end of each chapter.

consider it so. Reliable information depends as much on the kind of schedule used and the ability of the investigator, as it does upon the farmer himself, in fact, more so. The farmer has the facts, and if one knows how to induce him to impart what he knows, these facts are obtainable.

The information called for in the schedule, a sample of which may be found in appendix IV, is a record of the details of the year's business on each farm studied, rather than of any general questions concerning it. For instance, rather than ask the farmer what his total expenses for the year were, it was found better to ask him concerning each item of expense. As a rule, farmers do not know their total expenses, but they do remember quite clearly what they pay for labor, seed, fertilizer, and the like.

The second part of the schedule contains queries about expenditures for the family, method of acquiring land, and other questions of a more general nature. It was realized that the length of the schedule might cause some difficulty and for this reason the investigator was asked to put his main effort on the part of the schedule pertaining to the farm business and then, if possible, complete the second part of the schedule. Consequently parts of the latter half of the schedule were not completely filled for all localities.

About one-half of the data were collected by advanced students registered for university credit, and the rest were obtained by paid assistants. Each investigator was native to the locality surveyed and was selected on the basis of his knowledge of farmers and farm conditions. Experience of the writer in rural survey work in China has demonstrated that the first consideration is one of using an investigator native to the locality studied and acquainted with the farmers. It is this factor which accounts for the selection of the particular localities of this study (map. I). Before beginning the survey, each investigator was carefully instructed in the use of the schedule. Such training of practical persons in the art of collecting information is quite feasible, but persons with little first-hand knowledge of farmers and farm conditions are unsuited for the first-hand investigational work, because they do not know how to approach the farmer. Proper methods of approach can only be learned by years of living and association with farmers.

Map. I.—The location of provinces and hsiens (irregular black spots) in China from which data were obtained (1921-1925)

Changes in names, such as Peking to Peiping and Chihli to Hopeh, are not made because the map refers to a period previous to such changes.

For all localities the investigators filled out a few schedules first and these were corrected and suggestions made before conducting the survey. It was impossible for any other trained man to stay in the field with the investigator throughout the whole of any of the studies. During the course of the surveys, however, records were sent in frequently to the office for checking. The entire work of one investigator was discarded as of questionable value. All doubtful records for individual farms have also been eliminated.

The investigators encountered the difficulties natural in making such a survey. In the first place, the farmers were suspicious and difficult to approach and it was necessary to gain their confidence. Their chief fear was that the information they gave would be used as a basis for increased taxation or, in one case, for seizure of the land by a new militarist. Such difficulties were met with the help of friends or relatives living in the localities studied. These persons did much to explain away successfully any serious doubts in the farmer's mind. The length of the schedule was the most serious obstacle, since farmers soon became tired of answering so many questions. It was only because of personal connection that the good will of the farmer could be obtained for a long enough time to complete each schedule.

It is recognized that data from each locality for the same year would make comparisons more easy but limited opportunity to obtain suitable investigators precluded any other method than the one used. Of course, data collected in successive years would also have been invaluable but this as well was impossible of accomplishment. Changes in price levels should be considered in the appraisal of the results of the studies made in different years. The index numbers of these changes are shown in table 19, chapter VI, and from them it is seen that for the year studied the difference in price level is not enough to affect seriously comparisons between localities except possibly in Hwaiyuan Hsien, Anhwei, where prices were high for the year studied, and in Chinhai Hsien, Chekiang, where the difference is also significant. With these two exceptions, price levels may be ignored.

The possible differences in price level between North and East Central China should be known, as it is commonly observed that people of North China live with less money income than do people in East Central China, but no data exist to show whether

this is primarily a difference in standards or in variations in price levels. The present study shows higher values and higher incomes in East Central China for all items than in North China.

TABLE 1. SOURCES OF DATA BY PROVINCES AND HSIENS, YEARS FOR WHICH DATA WERE OBTAINED, NUMBER OF FARMS STUDIED AND THE NAMES OF THE INVESTIGATORS

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Years to which data pertain	Number of farms studied	Names of investigators
North China			
Anhwei			
Hwaiyuan 懷遠	Oct. 1924—Sept. 1925	124	Keng Yu-chu 耿玉柱
Su 宿縣	Sept. 1923—Aug. 1924	286	Kao Yen-chêng 高雁丞
Chihli			
Pingsiang* 平鄉	Feb. 1923—Jan. 1924	152	Hoh Lien-chen 霍連珍
Yenshan 鹽山	Apr. 1922—Mar. 1923	150	Ts'ui Yu-tsuin 崔毓俊
Yenshan 鹽山	Apr. 1923—Mar. 1924	133	Ts'ui Yu-tsuin 崔毓俊
Honan			
Sincheng 新鄭	Apr. 1923—Mar. 1924	144	Liu Kwoh-si 劉國士
Kaifeng 開封	Aug. 1923—July 1924	149	Niu Tung-kao 牛東皐
Shansi			
Wusiang 武鄉	Jan. 1922—Dec. 1922	251	Heh Ch'in-ming 郝欽銘
Wutai 五台	July 1922—June 1923	226	Kao Ying-fêng 高映峰
Total		*1615*	
East Central China			
Anhwei			
Laian 來安	June 1921—May 1922	101	Pi Ju-fan 畢汝藩
Laian 來安	June 1922—May 1923	100	Pi Ju-fan 畢汝藩
Wuhu 蕪湖	May 1921—Apr. 1922	102	Tao Yên-ch'iao 陶延橋
Chekiang			
Chinhai 鎮海	Apr. 1921—Mar. 1922	67	Liu Tung-hsin 劉同炘
Fukien			
Lienkiang 連江	Aug. 1922—July 1923	161	Chêng Keng 鄭庚
Kiangsu			
Kiangning(S)江寧 (淳化鎮)	Jan. 1923—Dec. 1923	203	Chang Ping-chu 張炳渠
Kiangning(T)江寧 (太平門)	Oct. 1923—Sept. 1924	217	Chu Li 儲禮
Wuchin 武進	Jan. 1924—Dec. 1924		
	Aug. 1923—July 1924	300	T'sao Po-ju 曹博如
Total		*1251*	
Total, 17 localities		*2866*	

*Fifty-six of these farms were located in a similar type of farming area in Hsingtai hsien.

In the analysis and summary of the data all clerical work has been checked once, often twice and frequently three times. While great care has been taken to avoid errors, still it is scarcely

TABLE 2. SOURCES OF DATA BY VILLAGES

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NAMES OF VILLAGES	Total number of farm families in the villages	Number of farm families included in this study
North China			
Anhwei			
Hwaiyuan ..	Keng-chia-tsuin, 耿家村	150	124
Su	Fifty-three villages within a several mile radius of Fulichi, 符離集	1980 (for 49 villages)	286
Chihli			
Pingsiang ..	To-tchuang, 豆庄	225	96
	Hsin-tien, 辛店	56	56
Yenshan (1922)	Wu-chia, 吳家	92	85
	Kuo-chia, 郭家	127	56
	Yang-mao, 楊帽	18	9
Yenshan (1923)	Tuan-chuang, 段庄	118	102
	Chao-chia-chuang, 趙家庄	55	21
	Li-hsiao-tien-tzu, 李小店子	120	8
	Wu-chia-koh, 吳家閣	84	2
Honan			
Sincheng ..	Kuo-chia, 郭砦	—	5
	Nan-chou-chuang, 南周庄	—	5
	Hai-chia, 海砦	—	9
	Ho-li-wang, 河裏王	—	3
	Kuo-tien, 郭店	—	88
	Yuen-ling-fu, 鄢陵府	—	34
Kaifeng	Ta-niu-tien, 大牛寨	—	59
	Wang-pai-chai, 王白寨	—	27
	Hsing-lung-chi, 興隆集	—	20
	Shung-cheng-chi, 順城集	—	7
	Shang-chai, 尙寨	—	11
	I-tieh-wang, 一帖王	—	6
	Wang-fu-chuang, 王府庄	—	5
	Shuang-miao, 雙廟	—	5
	Pan-lou, 潘樓	—	5
	Hsiao-niu-chai, 小牛寨	—	4
Shansi			
Wusiang	Ma-mu, 馬牧	104	96
	Chai-shang, 寨上	90	85
	Hsing-chuang, 型庄	80	42
	Wa-li, 凹裏	30	28
Wutai*			
	Nan-ta-hsien, 南大賢	350	57
	Nan-ju, 南茹	300	55
	Su-tzu-po, 蘇子坡	500	43
	Tung-ju, 東茹	300	17
	Chi-li-kou, 七里溝	150	11
	Nan-yang, 南陽	100	13
	Pei-yang, 北陽	50	5
	Pei-ta-hsien, 北大賢	350	25

*Most of the farms from which records were obtained represent the larger farms.

TABLE 2.—*(Continued)*

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NAMES OF VILLAGES	Total number of farm families in the villages	Number of farm families included in this study
East Central China			
Anhwei			
Laian (1921)* .	Forty-six small villages	—	101
Laian (1922)* .	Thirty-seven small villages surrounding Laian city	—	100
Wuhu	Kao-kang-pu, 高岡埠	—	47
	Yu-chiang, 漁港	—	35
	Ta-tang, 塔塘	—	20
Chekiang			
Chinhai	Kwei-ssu-chiao, 貴駟橋	—	26
	Nan-hung, 南泓	—	18
	Tuan-chiao, 團橋	—	23
Fukien			
Lienkiang ..	Shan-tsang-shan, 山藏山	—	23
	Tung-hu, 東湖	—	96
	Shan-hsia, 山下	—	42
Kiangsu			
Kiangning (S)	Fifteen villages within a several mile radius of Chun-hwa-chen. 淳化鎮	1098 (for 14 villages)	203
Kiangning (T)	Forty-nine hamlets North of Taipingmen Station, 太平門車站	—	217
Wuchin	Forty-nine villages within two mile radius of Tsao-chia-chiao. 曹家橋	—	300

*A larger proportion of the richer farm families were included in the study than occurs for the region as a whole.

to be expected that all have been avoided, and if any are discovered by the reader, the writer would greatly appreciate having his attention called to them. Some of the computations are quite complicated and one should be certain that the correct method of calculation has been used when one attempts checking results.

In all calculations decimals were carried to one place more than desired and all numbers of five or above were taken as one and added to the previous decimal place.

Numbers in parenthesis refer to literature cited at the end of each chapter. Data presented in the text are sometimes stated with decimals omitted.

Since making this study in the years 1921-1925, the name of the province formerly known as Chihli has been changed to Hopeh, and the name of the city formerly known as Peking has been changed to Peiping. The data, however, apply to a period previous to the present government at Nanking, and in order to avoid confusion, names of places have been kept as they were at the time when the data were collected.

REGIONAL CONDITIONS

If China were divided into two major regions the division would be North and South China, and, if a definite boundary line were drawn, it could best be made along the Hwai River and westward. The section between the Hwai and the Yangtze shows a gradation between North and South China conditions, but it is predominantly southern because of the prevalence of rice growing and the absence of the various typical North China features, three of which are the use of a cart, drilling rather than broadcasting of grain and the non-use of liquid night-soil. Hwaiyuan Hsien, Anhwei, is between these two regions, and this is evident partly from the use there of the cart and of liquid night-soil, and by the broadcasting of grain.

In separating the seventeen localities studied it was first thought best to use the two major regions, North and South China but so many of the localities south of the Hwai River are located

TABLE 3. ANNUAL PRECIPITATION (mm.) FOR PLACES TYPICAL OF THE LOCALITIES STUDIED

Places	Number of years	Mean	Maximum for any one year	Minimum for any one year
Chihli				
Tientsin	35	509	796 (1912)	254 (1902)
Taming	6	536	867 (1910)	251 (1920)
Anhwei				
Nanhsuchow (Su Hsien)	6	622	757 (1925)	475 (1919)
Kiangsu				
Nanking	20	1069	1621 (1915)	576 (1913)
Chekiang				
Ningpo	38	1386	2135 (1889)	912 (1910)
Fukien				
Foochow	23	1435	2730 (1906)	896 (1913)

in what might be considered East Central China, or the lower Yangtze River Valley, that it was finally decided to limit the designation of the area to a term sometimes used; namely, East Central China. The one locality in Lienkiang Hsien, Fukien, really belongs to what might be rightly called South China, but has been included with the East Central China localities because the conditions are not so dissimilar as to affect seriously the averages for the localities in East Central China. If more localities had been studied in various parts of China, analysis could have been made according to natural regions such as have been suggested by Cressey (3). For instance, the two localities in Shansi might have been classed with the Loess Highlands. The localities studied in Chihli, Honan, and North Anhwei could well be classified in the North China Plains area, the locality in Fukien in the South-eastern Coastal area, and all others in the Yangtze Valley.

Climate

The climate of the loess highlands in Shansi and of the plains area of North China is dry, compared with the more humid East Central and South China. The amount of rainfall in East Central China is twice that of North China. In both regions the maximum amount of rainfall occurs in July and August. In North China nearly two-thirds of all the rainfall occurs during these two months, whereas in East Central China a larger proportion of the total is during other months. The dryness of the North China climate is characterized by the dry freezing of newly planted trees, and more especially of grape-vines, which are buried in the soil in the autumn for protection. Another characteristic of the North China plains is the dry winds of the winter and early spring, often accompanied by dust-storms. Thus does evaporation diminish the moisture content of soils already limited by scanty rainfall. There is much sunshine in the winter in North China compared with the much more cloudy weather in East Central China. This is shown by the ease with which vegetables grow under glass in Peping as compared with Nanking.

Another characteristic of North China is that so much of the area is subject to either floods or droughts, or to both. Irregularity of rainfall is typical of both North and East Central

TABLE 4. ANNUAL AND MONTHLY MEAN TEMPERATURE (C) FOR PLACES TYPICAL OF LOCALITIES STUDIED

Places	Number of years	Annual mean	Months											
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Chihli														
Tientsin	10	12.0	−4.1	−1.8	4.7	12.7	19.5	23.7	26.1	25.9	20.8	14.2	4.5	−2.4
Taming	4	13.9	−2.1	0.5	5.8	14.3	21.9	25.7	28.8	27.5	21.4	16.0	6.9	0.4
Anhwei														
Nanhsuchow (Su Hsien)	10	15.2	1.3	3.2	8.2	15.5	20.9	25.7	27.3	27.8	22.7	17.1	9.5	2.8
Kiangsu														
Nanking	10	15.2	3.1	4.2	8.3	14.0	19.9	24.0	27.4	27.3	22.6	17.3	10.3	4.5
Chekiang														
Ningpo	35	16.6	5.4	5.4	9.2	14.8	19.7	24.0	27.8	28.0	24.3	19.2	13.3	7.7
Fukien														
Foochow	15	20.1	11.7	10.9	13.5	18.0	22.4	26.8	28.9	29.1	26.6	22.6	17.7	13.1

TABLE 5. EXTREME MAXIMUM TEMPERATURE (C) BY MONTHS FOR PLACES TYPICAL OF LOCALITIES STUDIED

Places	Number of years	Months											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Chihli													
Tientsin	10	10.8	14.2	24.3	32.7	41.2	41.9	40.4	39.4	32.8	31.3	21.7	11.3
Taming	4	10.5	11.2	23.3	29.5	37.0	36.4	37.0	38.2	28.5	25.0	19.5	14.8
Anhwei													
Nanhsuchow (Su Hsien)	10	18.9	16.7	28.9	33.9	38.4	40.6	40.9	37.8	35.6	28.9	29.4	20.6
Kiangsu													
Nanking	10	18.0	20.4	31.1	33.5	35.4	37.4	40.2	38.5	35.3	31.8	27.2	20.3
Chekiang													
Ningpo	35	24.4	25.5	30.0	33.9	36.6	39.4	40.0	38.3	38.3	31.6	32.2	26.1
Fukien													
Foochow	15	27.2	26.1	28.9	33.9	35.5	36.6	37.8	38.9	36.6	32.8	29.4	25.5

TABLE 6. EXTREME MINIMUM TEMPERATURE (C) BY MONTHS FOR PLACES TYPICAL OF LOCALITIES STUDIED

Places	Number of years	MONTHS											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Chihli													
Tientsin	10	–18.7	–18.6	–10.3	–2.5	4.9	9.4	16.4	13.7	9.1	0.4	–12.1	–15.8
Taming	4	–13.7	– 9.3	– 6.1	0.6	9.1	14.7	20.0	19.2	12.4	6.0	– 4.5	– 8.4
Anhwei													
Nanhsuchow (Su Hsien)	10	–12.2	–11.7	– 7.8	–2.2	7.8	11.1	16.7	17.2	7.2	0	– 8.9	–12.2
Kiangsu													
Nanking	10	–10.2	– 8.1	– 5.0	–0.6	7.5	15.2	18.0	18.5	11.0	3.6	– 4.2	– 9.2
Chekiang													
Ningpo	35	–10.6	– 6.7	– 3.9	1.1	2.2	10.5	12.2	14.4	12.8	5.0	– 2.8	– 6.1
Fukien													
Foochow	15	– 1.7	1.6	3.3	3.9	11.6	16.6	20.5	20.0	16.6	11.1	4.4	2.2

TABLE 7. EARLIEST FIRST AUTUMN AND LATEST LAST SPRING FREEZING TEMPERATURES REPORTED (C) FOR PLACES TYPICAL OF THE LOCALITIES STUDIED*

Places	Autumn						Spring						Frostless season (approximate number of days)
	October			November			March			April			
	Temperature	Day	Year	Temperature	Day	Year	Temperature	Day	Year	Temperature	Day	Year	
Chihli													
Tientsin	1.9	22	1912	–1.4	3	1910	...	...	...	–1.3	7	1909	205
Taming	...	...	...	0.3	7	1907	–1.8	26	1909	...	...	...	210‡
Anhwei													
Nanhsuchow (Su Hsien)	0	14	1927	1.5	16	1910	...	...	...	–0.5	9	1925	190
Kiangsu													
Nanking	...	...	...	2.1	5	1914	...	...	...	–0.6	4	1914	205
	...	...	...	–2.1	9	1912	...	...	...	...	...	...	...
Chekiang													
Ningpo	...	...	...	1.6	5	1895	0.0	27	1909	...	...	...	217
	...	...	...	0.0	6	1895	...	...	...	...	...	...	...
Fukien†													
Foochow	...	...	...	...	...	...	...	...	...	...	...	...	365

*In a few instances temperatures as high as 2° C above freezing are recorded because frost occurs on the ground at such temperature.
†Freezing seldom occurs at Foochow. A temperature of 0° C was recorded January 22, 1892, and of 1.6 on January 15, 1893, and of –1.7° on January 16, 1893.
‡The records for Taming are for four years only. This reduces the possibility of very early autumn or very late spring frosts and consequently the season appears to be longer than in other northern localities.

China but more so in North China, and this accounts for either floods or droughts. Such conditions may affect large areas in North China during the same season and thus cause famines. Drought in East Central China may decrease crop production, but not to such an extent as to result in famines. Floods occur in some of the valleys of Chekiang Province, but affect only small areas at one time. Typhoons in East Central China sometimes cause considerable damage to the rice crop, either to the rice blossoms or by shattering the half-ripe or ripe grain.

Meteorological data do not exist for all the localities studied, but are available for enough places to give a fairly adequate idea of the climates for the various localities studied (4). (5), (6). Such data are shown in fig. 1 and tables 3-7.[1]

The length of period between the earliest autumn frost and the latest spring frost reported varies from 190-210 days in North China to no frost in Lienkiang Hsien (Foochow), Fukien, except very rarely in mid-winter (table 7). Actually the average frostless season is longer than this period because seldom if ever would the two extreme dates of frost occur in the same year. Moreover, the average dates of first and last killing frosts would also give a longer season than indicated by the data presented in table 7. The growing season is even longer still because many of the crops grow after autumn frosts and before the spring frosts. These reported meteorological data confirm the uniformity of such dates as are found in certain Chinese books or as are sometimes verbally reported.

Data from Tientsin and Taming, Chihli, and Su Hsien, Anhwei, reflect the climate of the North China localities with the exception of Wutai, where the elevation is so high that low temperature prevents the growing of more than one crop a year. The precipitation is also greater at Wutai.

So cool and moist a climate is favorable to the growing of the oats and the Irish potatoes of the locality. Data for Luanfu, Shansi, are perhaps more representative of the climate of Wusiang Hsien, Shansi. Unfortunately, such data are obtainable for only three years, but are quite similar to that of Taming.

For the lower Yangtze Valley localities, data for Nanking are quite applicable. Ningpo meterological data well represent

[1] With the exception of temperatures for Nanhsuchow (which were recorded by the American Presbyterian Mission) all data are from the reports of the Siccawei Observatory, Shanghai (4) (5) (6).

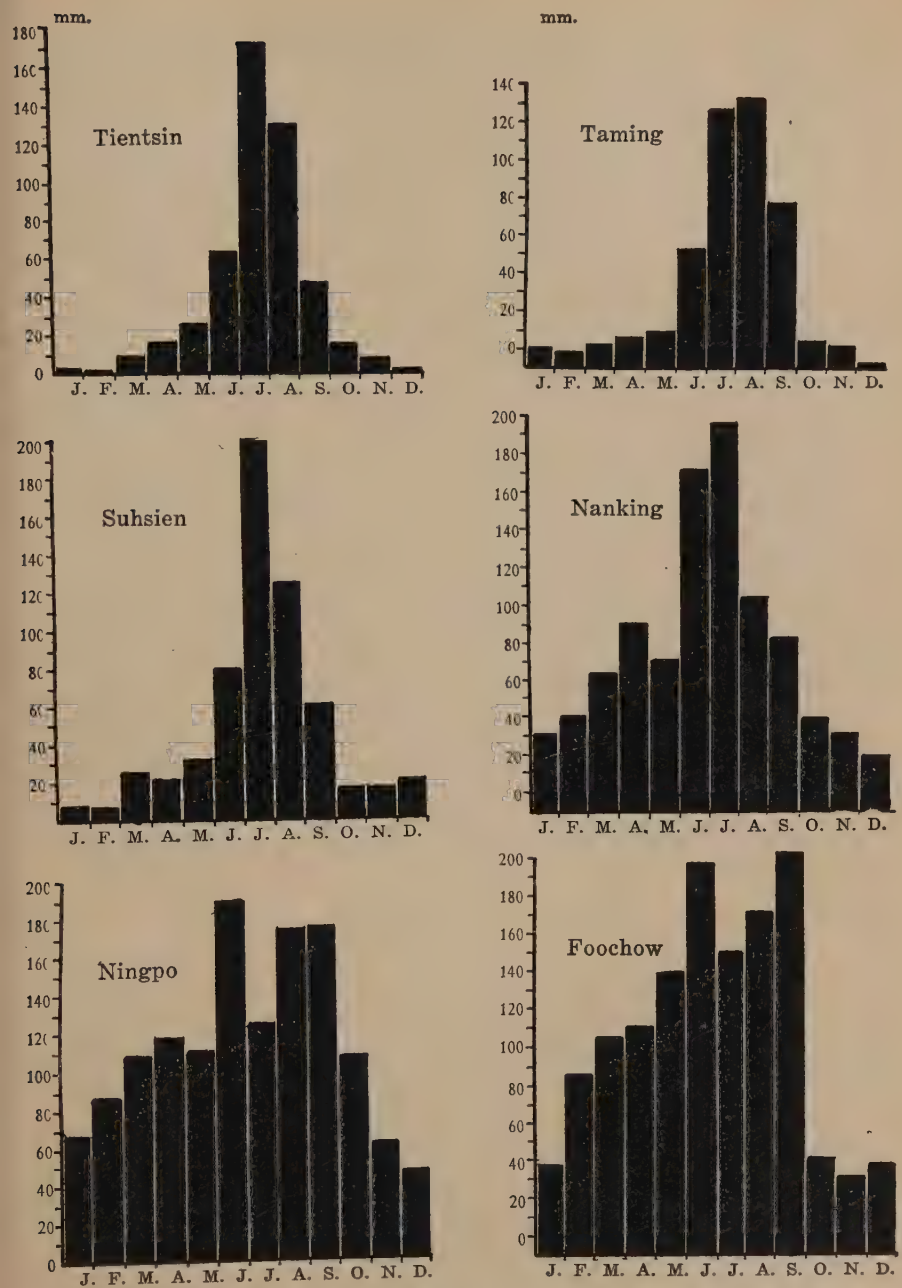

Fig. 1.—The mean monthly precipitation (in millimeters) for six places in China typical of the localities studied.

the climate of the farms studied a few miles away in Chinhai Hsien. The climate of Foochow is also practically the same as for the farms studied in Lienkiang Hsien about ten miles distant.

Topography and Soils

Topography is naturally quite similar for the localities in the North China plains area. Much of this level country has depressions here and there, sometimes extending a mile or two in diameter, and a few feet lower at the center than at the edge. These depressions collect the heavy summer rainfall and often become lakes, but the water usually recedes in time to plant wheat in the autumn. The harvest date for wheat is from the end of May until the middle of June, and it is seldom that summer rains come early enough to destroy the growing wheat. Villages are located around the edge of these depressions. Often these lowlands are planted to another crop after wheat harvest but only in slight hope of reaping a return. Such conditions prevail in Yenshan Hsien, Chihli, Pingsiang Hsien, Chihli, (but not in Hsingtai Hsien), Kaifeng Hsien, Honan, and in Su Hsien and Hwaiyuan Hsiens, Anhwei. The land at Sincheng Hsien, Honan, upon which the farms studied are located, is higher and is not subject to flood. A local adage is "Fear drought but not rain." Both Kaifeng and Sincheng Hsiens are subject to famine from droughts. Sincheng Hsien is in the very northwestern extremity of the Hwai River Basin and Kaifeng is in the northern part. The elevation of this plains area probably does not exceed 100 meters, except for the hills rising out of the plains in some sections. The soils of the plains area are alluvial and most localities have variations in texture from fine or very fine sand to clay loam or clay soils. A common characteristic is the presence of white alkali spots and these are more prevalent in Yenshan and Pingsiang Hsiens, Chihli, than in any of the other localities. In fact, it is because of alkali that the farms studied in Yenshan Hsien for the year 1923 are twice as large as those farms not so near the ocean and studied for the year 1922. The soils on the farms studied in Yenshan Hsien, Chihli, and in Hwaiyuan Hsien and Su Hsien, Anhwei,

1. *A transplanted shrub, on the Taiyuan plain of Shansi province, covered with dried mud to protect it from dry-freezing. Burying grapevines for such protection is a universal practice in North China.*

2. *Terraced mountain sides in Fukien province.*

are not very productive because of alkali or low lying land or other causes.

Very different topographically from the North China plains area are the localities of Wusiang and Wutai Hsiens, Shansi, which are in mountains of loess soils. Both have an elevation estimated at about 1,000 meters above sea level. The farm land consists of fields on a plateau in Wusiang Hsien and in a basin in Wutai Hsien, and of terraced fields on the hillsides. Flooding sometimes occurs for small areas in Wutai Hsien.

In East Central China, the localities studied in Laian Hsien, Anhwei, and Kiangning Hsien, Kiangsu, have a topography of low hills and bottom lands of areas varying greatly in size. In Kiangning Hsien some of these hills are of loess origin. The elevation of the bottom lands is approximately 200 meters above sea level.

The soils of these localities have varying textures from a very fine sandy loam to heavy yellow clay or black clay loam. The rolling land of Laian Hsien is the eastern extremity of the Central Mountain Belt, where it soon merges into level flood plain.

The farms studied in Wuhu Hsien, Anhwei, are situated in the flood plain of the Yangtze and are level and low lying. The tributary stream running through this region to the Yangtze has a high dyke to prevent flooding the fields. The elevation is approximately 200 meters. The soils are of a very productive black clay loam.

The topography of farms studied in Wuchin Hsien, Kiangsu, is level; the dark clay loam soils are very fertile and of alluvial origin. The elevation approximates 170 meters and there is no danger of floods.

At Chinhai Hsien, Chekiang, the farms studied are about ten miles east of Ningpo and are a part of the delta of the Yung (甬) river. The elevation is only a few meters above sea level, but flooding does not occur. The soils are of clay and fine yellowish sand, the latter, which is higher, is used for the growing of cotton.

At Lienkiang Hsien, Fukien, the farms are located largely in the valleys between the numerous mountains typical of the province. A few terraced fields were in the area studied. The elevation of the valleys are estimated at fifteen meters. The soils are very productive and are of a dark clay loam in the

valleys where rice is chiefly grown and of fine sand near river beds or of sandy loam in the foothills. Soils are chiefly alluvial and the bed rock is granite.

Water Table

The water table, as shown by the distance of water from the ground surface in dug wells, is about eight to twenty feet for all localities except those in Shansi and possibly Sincheng Hsien, Honan, where it is greater.

Irrigation

Irrigation is a universal practice for all the localities growing rice. With the exception of this crop, however, it occurs for other farm crops in the localities studied only at Pingsiang and Hsingtai Hsiens, Chihli; in Pingsiang about 60 per cent of the land is irrigated from streams and two per cent from wells, while in Hsingtai ten per cent is from wells only.

Location in Relation to Marketing Facilities

The lack of economical and dependable transportation facilities in China greatly hampers the development of agriculture. All localities, with the exception of Wusiang and Wutai Hsiens, Shansi are reasonably accessible to railroad facilities. Such proximity is of great advantage in those regions in North China where products may be transported by cart to the railroad station, or by boat in East Central China, as at Wuchin Hsien, Kiangsu, where canals are fairly numerous. Wheat from Yenshan Hsien, Chihli, is carted thirty miles to the railroad station at Tsangchow. But even here the unimproved roads make transportation difficult, especially during the rainy season, and it is during the rainy season that much wheat has to reach the market. Wutai Hsien, Shansi, is far from all modern transportation systems. The chief marketing center for Wusiang, Shansi, is Shunteh, Chihli, and the chief products of millet, kaoliang, and wheat are taken by donkey over a distance of 50 kilometers. Eggs and chickens are shipped overland to Taiku, Shansi, a distance of 100 kilometers.

At Laian Hsien low water in the canal often prevents shipment of the rice crop and when such a condition prevails the price is very low.

The farms in the Kiangning Hsien (S), Kiangsu, area, are near the market town of Chunhwa, about fifteen kilometers southeast of Nanking. Transportation is by donkey chiefly and is so uneconomical that prices of farm products are necessarily low compared with the market price in Nanking. A good road with wagon or motor truck transportation would undoubtedly be a great help to the farmers.

Since no special study of transportation and marketing was made it will not be discussed further. Absence of transportation facilities is one of the chief factors causing or aggravating famines but the coming of railroads has greatly helped the North China localities in this respect.

DEFINITION OF TERMS

Age refers to age at last birthday according to Western methods of computation, unless otherwise indicated. Ages in China depend on the relation of the time of birth to the Chinese New Year. A year is added to a person's age on each New Year's day rather than on the birthday itself. In this table one year has been subtracted from the Chinese age, thus making the data equivalent to age at last birthday as obtained in Western countries. A Chinese child of three years or under may have its age given in terms of "chow" (週), or, if under one year (Western), in months. The term "chow" is equivalent to one year. Western age and the term "month" refers to the lunar month. An infant born on New Year's Eve (before 12 midnight) is two years old the next day.

Adult-male unit is used for the measurement of food consumption. Individuals were reduced to such units by the use of Atwater's scale in the following table:—

TABLE 8.—CONVERSION FACTORS FOR CHANGING INDIVIDUALS OF DIFFERENT AGES AND SEX TO ADULT-MALE UNITS

Age	Equivalent adult male units		Age	Equivalent adult male units	
	Male	Female		Male	Female
Adult (over 16)	1.00	0.80	10-11	0.60	0.60
15-16	.90	.80	6-9	.50	.50
13-14	.80	.70	2-5	.40	.40
12	.70	.60	Under 2	.30	.30

An *animal unit* is estimated by taking the ox as a unit. Other animals are reduced to animal units by considering an

equal amount of feed eaten and manure produced as being equivalent to one unit. Thus five hogs, ten pigs, two-thirds of a water-buffalo, one horse, one mule, two donkeys, or 100 chickens, equal an animal unit.

An *animal-work unit* is the average amount of work accomplished by a labor animal unit in a ten-hour day, and is used to measure the efficiency of animal labor on productive farm enterprises such as crops or animals.

Average is the mean, arithmetic average, and is a calculated number affected by every value of a variable. Averages are computed for the most part by localities, that is, by average of averages, because the type of farming varies with the locality; for this reason the locality is the unit taken.

Crop area represents the land area devoted to crops including uncultivated land used for growing grass and bushes for fuel.

Crop mow or crop hectare, refers to the number of mow or hectares, of different crops raised in one year. Since double-cropping is often practiced, one mow, or hectare, of crop area may be equivalent to two or more crop mow or crop hectares.

Correlation coefficient, or gross correlation (r), is a number that indicates the degree of association between two factors or variables. It can ever be higher than +1 nor lower than -1. The nearer it is to ±1 the higher the positive or the negative correlation. A coefficient to be particularly significant should be at least four or five times its probable error.

Coefficient of variability (C) is a relative measure of variability which signifies the extent to which a factor varies from the mean and may be used to compare with other factors regardless of the units of measurement. It is the best dispersion measure for all classes of observations. Since it is a percentage number, minus signs are omitted.

The *currency* in which values are given is Chinese silver currency unless otherwise indicated. The average bank exchange rate (Shanghai) of one hundred gold dollars into Chinese silver currency was as follows:—

Year	Rate	Year	Rate
1921	$197.56	1924	$190.20
1922	184.60	1925	182.38
1923	191.74	Average (1921-'25)	189.30

An *economic family* consists of all members of the family and any absent relatives of the family who share in the family budget.

Family is a term used to include all relatives living and eating together. It may be either the larger family, which includes near relatives of the operator and his wife, such as operator's brothers, brothers' wives and children, and operator's parents, employes, and so forth, or it may be the family consisting only of husband, wife, and their children.

Family earnings are computed by adding to operator's farm receipts the income from other than farm sources, plus the rent value of the residence, and from this all operator's farm expenses, except the value of family labor, are subtracted.

Family income is the actual amount of money gained by the operator from the year's business. It is obtained by subtracting the operator's cash farm expenses from his cash farm receipts.

A farm includes all the land worked or managed by one operator. In these studies the farm is primarily the source of support for the operator and his family.

Farm earnings are the difference between farm receipts (including value of farm products used by the family) and expenses (including value of unpaid family labor but exclusive of the operator's labor). Such earnings on tenant and part owner farms, unless designated operator's farm earnings, have been computed for the whole farm by including the landlord's expenses and receipts with those of the operator.

Farm labor earnings are obtained in the same way as operator's labor earnings except that on tenant and partowner farms, the landlord's expenses and receipts are included in the computations.

Farm labor income differs from farm labor earnings in that produce from the farm used by the family is not included as receipts.

The *green (Mung) bean* is botanically known as *Phaseolus aureus*.

A *household* consists of all persons living and eating together, including non-relatives, such as hired laborers.

A *hsien* is a political division corresponding to a county. Each hsien has a city, like a county seat, which bears the name of the hsien and is a center of government for the hsien.

Throughout this study the hsien names refer to the hsien rather than to the city, unless the latter is so specified.

Labor returns are the earnings from labor for the total man equivalent. They are computed in the same way as farm labor earnings except that no labor charge is made.

Man equivalent measures the number of workers on the farm in terms of the equivalent of one man working for a period of twelve months.

A *man-work unit* is the amount of work the average farmer accomplishes in a ten-hour day, and is used to measure the efficiency of man labor done on productive farm enterprises such as crops or animals.

Mean is synonymous with the arithmetic average.

Median is the mid-most, or central, value of a variable when the values are arranged in order of magnitude. Medians of medians are used for average by localities.

Mode is the value of a variable that occurs with the greatest frequency.

Operator refers to the farmer who manages the farm and who usually participates in the manual labor.

Operator's labor earnings are the returns the farm operator receives for his year's labor and management, after deducting farm expenses and the interest on his capital investment. The unpaid labor of the family, except that of the operator, is charged as an expense. The produce from the farm used by the family is included as a receipt. The interest rate used is eight per cent, a common bank rate which could be secured by the farmer if he should sell out and invest his money in a modern bank savings account. It is much lower than the local interest rates. Capital includes the value of land as well as of livestock, tools, equipment, and farm buildings (including residence).

The term labor earnings, rather than labor income, is accepted in this study because in the United States labor income has come to mean the income from labor and managing ability exclusive of the value of produce used from the farm by the family. In China such a large amount of the products raised on the farm is consumed by the family, and the families vary so greatly in size, that it is very difficult to measure returns by the labor income method.

The *owner* is an operator who works his own land.

Oxen refer to the "yellow cow," the literal translation from the Chinese. The female cow as well as the castrated and non-castrated animals are included in the term oxen.

Probable error is a number computed to indicate the reliability of results and is written with a plus and minus sign before it. When a value equalling four times the probable error is added to and subtracted from a given result it sets off limits such that there is a chance of about one in one hundred and forty-three of an observation falling beyond these limits.

Soybeans are the yellow soybeans unless otherwise designated.

TABLE 9. CONVERSION TABLE OF LOCAL LAND MEASURE INTO PEKING STANDARD*, UNITED STATES STANDARD AND THE METRIC SYSTEM†

Seventeen localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	EQUIVALENTS OF ONE LOCAL MOW IN		
	Peking Standard (mow)	U. S. Standard (acres)	Metric System (hectares)
North China			
Anhwei			
Hwaiyuan	1.30008	0.19714	0.07988
Su	1.28579	0.19521	0.07900
Chihli			
Pingsiang	0.92054	0.13976	0.05656
Yenshan (1922)	1.31412	0.19951	0.08074
Yenshan (1923)	1.31412	0.19951	0.08074
Honan			
Sincheng	1.13516	0.17234	0.06974
Kaifeng	0.94467	0.14342	0.05804
Shansi			
Wusiang	1.05933	0.16083	0.06509
Wutai	1.01020	0.15337	0.06207
East Central China			
Anhwei			
Laian (1921)	0.89818	0.13636	0.05518
Laian (1922)	0.89818	0.13636	0.05518
Wuhu	1.09778	0.16667	0.06745
Chekiang			
Chinhai	1.01988	0.15484	0.06266
Fukien			
Lienkiang	0.69706	0.10583	0.04283
Kiangsu			
Kiangning (S)	1.21293	0.18415	0.07452
Kiangning (T)	0.99233	0.15066	0.06097
Wuchin	1.16961	0.17757	0.07186

*This is the standard adopted by the Peking Government in 1915.
†One hectare is equivalent to 16.28 Peking Standard mow and to 2.471 acres.

Standard deviation is a number which measures absolute variability from the mean and is of such a nature that when added to and subtracted from the mean it will include 68 per cent of all the observations.

Vermicelli made from the green (mung) bean, *Phaseolus aureus*.

The system of weights and measures used in this study is the metric system. The National Government of China has recently adopted a system based upon fractional units of the metric system, but these regulations have not been put into practical use. The variations in local weights and measures are so great that for comparative purposes it is absolutely necessary to have the data put into some standard system (table 9). In a few tables where comparisons between localities are not made the local system has been kept. The chapter on farm tenancy was completed before the adoption of the new system and therefore has not been converted from the Peking Standard system to the metric system.

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CHAPTER II

FARM LAYOUT AND LAND UTILIZATION

OPEN FIELD SYSTEM

The field system of any country has much to do with the progress of its agriculture. In England, for example, enclosures were an important factor in the improvement of farming, and while conditions in China are not altogether like those previously existing in England, yet the open field system of unfenced scattered plots of land farmed by one family corresponds very closely to the former strip system not only of England but also of other European countries. Progress in the agriculture of these countries has been marked since the old system was abandoned, and this should be remembered now when the new agricultural policies of China are being formulated.

Non-Contiguous Plots

The open field system with non-contiguous plots is prevalent in each locality. Plots commonly consist of one or more than one field. For fifteen of the localities studied there were 8.5 plots per farm with an average size of 0.39 hectares, or very nearly one acre (table 1). In East Central China the plots, like the farms, are smaller in size than in North China, and average 0.34 hectares compared with 0.44 hectares for North China. The smallest plots found in each locality averaged 0.05 hectares and the largest plots 2.72 hectares, or 6.7 acres. The smallest plot in any one locality is 0.01 hectares, and was found in both Hwaiyuan Hsien, Anhwei, and Wuchin Hsien, Kiangsu. The largest plot is 5.53 hectares and is in Su Hsien, Anhwei.

Distance of Plots from Farmstead

The fact that for all localities 8.5 plots per farm are separated from each other raises the question of how far such plots are from the farmstead. The average distance for all plots is 0.63 kilometers (0.9 li) or nearly one third of a mile. Such distance in North China is over 2.6 times as great as in

TABLE 1. NUMBER OF NON-CONTIGUOUS PLOTS PER FARM, AND SIZE AND DISTANCE OF PLOTS FROM THE FARM RESIDENCE

2540 farms, 15 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Number of plots	Size of plots (hectares)			Distance (in kilometers) to plots	
		Average	Smallest	Largest	Average	Farthest
North China						
Anhwei						
Hwaiyuan	13.5	0.25	0.01	1.92	1.15	3.46
Su	8.5	0.51	0.04	5.53	0.52	3.46
Chihli						
Pingsiang	5.1	0.21	0.02	1.47	0.69	3.46
Yenshan (1922)	4.3	0.44	...	...	0.81	3.46
Yenshan (1923)	6.4	0.52	0.02	4.84	1.38	11.52
Honan						
Sincheng	5.1	0.57	0.14	2.09	0.58	3.46
Kaifeng	4.9	0.63	0.06	2.90	0.58	2.30
Shansi						
Wusiang	5.0	0.35	...	...	0.86	2.30
Average by localities.	*6.6*	*0.44*	*0.05*	*3.13*	*0.82*	*4.18*
East Central China						
Anhwei						
Laian (1921)	43.4	...	...	...	0.52	5.18
Wuhu	7.2	0.23	0.13	0.54	0.17	1.73
Chekiang						
Chinhai	3.4	0.39	...	...	0.17	1.15
Fukien						
Lienkiang	3.2	0.29	...	...	0.58	2.88
Kiangsu						
Kiangning (S)	8.2	0.27	...	...	...	4.03
Kiangning (T)	4.8	0.48	0.05	3.05	0.12	0.58
Wuchin	4.1	0.36	0.01	2.16	...	1.15
Average by localities.	*10.6*	*0.34*	*0.06*	*1.92*	*0.31*	*2.39*
Average by 15 localities	*8.5*	*0.39*	*0.05*	*2.72*	*0.63*	*3.34*

East Central China and perhaps is one reason why carts are used in North China to haul fertilizer to the fields and harvested crops to the farmstead, whereas in East Central China, except in the canal region, such work is done largely by farmers themselves with a carrying pole over the shoulders. The farthest plots in each locality average 3.34 kilometers (5.8 li), or nearly two miles from the farmstead, and the distance is 1.75 times greater in North than in East Central China.

3. *Rice fields near Foochow, Fukien. The mountainous topography is typical of the province.*

4. *Long narrow fields, this one about one-eighth of a mile in length, are frequently found in Shantung province. At the left there is millet, in the center tobacco, and at the extreme right Kaoliang. The photograph was taken on July 17, 1924.*

A TYPICAL LAYOUT

Farm layouts for each locality would make an interesting study, but this was not within the scope of the original schedule, nor has it been possible to revisit all the localities with this special aim. In fact, the subject of farm layouts could well fill a book in itself. One typical farm layout has been selected in the Tungchiao farming village of Kiangning Hsien (S), Kiangsu, about five li from the market town of Chunhwachen. Some of the 203 farms in Kiangning Hsien (S) study are included in this farm layout. The topography of this locality is quite typical of that for several adjacent hsiens and illustrates conditions in other low hill and valley regions in the rice growing districts of East Central China and to a certain extent of Central China in such a province as Hunan. In studying the farm layout (map I) it should be remembered that many parts of China have types of layout differing from this, especially in relation to topography and in the use of ponds for catching run-off from low hills for rice irrigation purposes. For instance, the irrigation practiced in the North China plains is largely dependent on wells or sometimes on streams. In level sections of East Central China, irrigation for rice is from canals or lagoons, whereas in the mountainous loess country of Shansi, there is little irrigation.

It should be noted that the topography of the selected layout consists of finger-like foothills, extending from higher mountains to the northeast of the area shown on the map. These finger-like projections dwindle down at the left of the map into rich level rice fields below the contour line of 300 feet. The valleys between these hills are chiefly devoted to rice. The hills themselves are long and low and are primarily used for graves. Such hill land is in grass, which is for the most part pastured, although some of it is cut for fuel every autumn. The graves are rather scattered and occupy 4.7 per cent of the hill land.[1]

Most of the fields in the valleys are used for rice and between each field is a solid ridge, which acts as a boundary

1. This percentage was obtained by Liu Rwen-tao, a student in the Department of Agricultural Economics, University of Nanking, in the autumn of 1928. The graves, on 548 plots of 2500 square feet each, were counted and the land occupied by them measured, then the two hills on either side of Tungchiao Village were measured and in this way the proportion of area devoted to graves determined.

and holds the water within a given field. For some of the fields these ridges take on the characteristic of a low terrace. Grass usually grows upon these boundaries and is used for grazing animals or is cut for fuel or fodder. The ponds are for irrigation and have been dug near the hills so that surface water may easily be caught, but are in a high enough position to irrigate the rice fields by gravity. In almost all cases, however, the water must be pumped by the Chinese wooden endless chain pumps, typical of East Central China.

The layout of these farms shows how widely separated the plots belonging to a single farm family may be and it also shows how far the plots often are from the village. All fertilizers applied to these fields and all harvested crops are carried on farmers' shoulders by means of a carrying pole. Without question if roads and carts were used there would be a saving of labor, but whether or not such a change in practice would be profitable requires careful study of available labor and of the cost involved in equipment and in the additional amount of land needed to make the road. The carrying of crops on men's shoulders adds greatly to the amount of labor during the busy season and for this reason as well as others, some more efficient system of transporting crops from the field to the threshing floor might prove of economic advantage. Were the land all in one piece and the farmstead located either in the center or in some other position as convenient in relation to the whole, such transportation costs would be diminished.

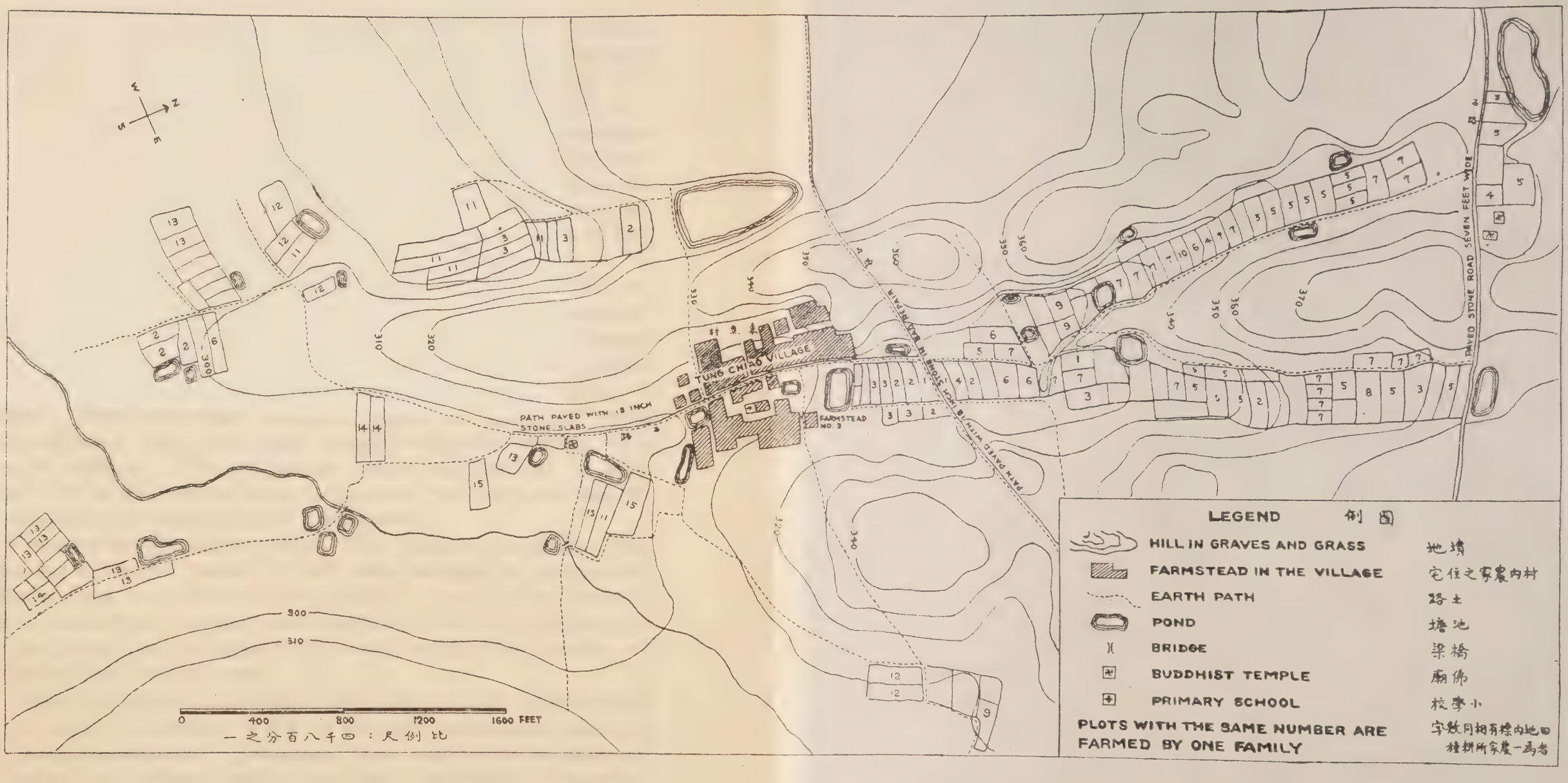
The absence of roads in this locality, as well as in East Central and South China, limits the introduction of certain improved farm machinery. In the case of a threshing machine, for instance, experience on the University of Nanking farms and the cost data show that a thresher can be used economically. The farmers neighboring the University have been very much impressed with the machine and asked the University to do custom threshing for them. With one exception, however, it was impossible to take the thresher to the various villages because there were no roads upon which the thresher could be moved and even the one road is so out of repair that the machine was upset in moving it between two villages.

MAP I. FARM LAYOUT

15 FARMS, TUNG CHIAO VILLAGE, CHUN-HWA CHEN, KIANGNING HSIEN, KIANGSU, CHINA (1928)

中國江蘇省江寧縣淳化鎮東焦村十五農家田地分佈圖

民國十七年



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ADVANTAGES AND DISADVANTAGES OF NON-CONTIGUOUS PLOTS

There are certain advantages but also many disadvantages in non-contiguous plots. The chief advantage, as given by Chinese farmers, is that the system prevents some farmers from having all good land and others all inferior land, or land adapted only to one kind of crop. For instance, in many parts of the great plains area of North China it would be a great disadvantage for a farmer to have only "lake land"[1].

Another similar example is in East Central China in sections where there are both hills and valleys. Here a farmer desires some land in both places, for the hill land supplies him with fuel (from grass and bushes and in some places firewood) and green manure (from grass) for rice fields. The advantages mentioned in these two instances could be kept in any re-adjustment of the field system, however, and a farm planned to include both kinds of land in one piece; only if this were impossible would it be necessary to have two plots of land in one farm.

Irrigation is another matter to be considered in the rearrangement of fields. In the hsiens of Wuchin (Changchow) and Tanyang of Kiangsu Province, it is a custom for farmers to cooperate by rotating wheat followed by rice in one section of contiguous fields and barley in association with soybeans in another. This facilitates irrigation since the irrigated fields are contiguous each year even though they may belong to a score of farmers. This advantage could undoubtedly be conserved even if the farms were re-arranged in one piece merely by continuing the same kind of cooperation.

Farmers in Kiangning Hsien (S), Kiangsu, maintain that by having scattered pieces of land some escape the ravages of locusts. That risk from insects, flood, or drought is lessened must be admitted, but this risk might be covered by insurance and the farmer at the same time could receive the benefits of having the land in one piece.

The advantages of having in one area all the land farmed by one family, therefore, while of utmost importance, need be only briefly mentioned. Boundary lines would thus be reduced in number and extent, saving land and diminishing boundary

1. "Lake land" is land which is usually flooded during the summer months but in most years dries early enough in the autumn to permit the raising of a crop of wheat or barley.

disputes; larger fields would be possible and time saved in making trips to fields. Further, if land were all in one piece, barriers, such as fences, hedges, or ditches, could be erected to obtain privacy and prevent trespassing, thieving, and gleaning. The control of irrigation and drainage water would be more easy; for instance, fields are now so scattered that often it is not economical for a farmer to dig a well for a small plot of ground and it is not always easy for several farmers to cooperate in using the same well. Control of pests, such as rodents, insects, and diseases, would also be less difficult. The advantages of having land in one piece so outweigh disadvantages that it seems economically advisable to undertake rearrangement of fields in China.

THE FARMSTEAD

A typical farmstead of one of the large families included in the survey of farms in Kiangning Hsien (S), Kiangsu, is shown in fig. 1, and belongs to the farm numbered three in the farm layout (map I). Unlike many farm residences, this one faces west rather than south. The laborer's rooms are situated in a separate building some distance from the main residence and adjacent to the stable. This is a common arrangement and has certain advantages for the laborer who may feed the animals early in the morning and then slip back to bed again.

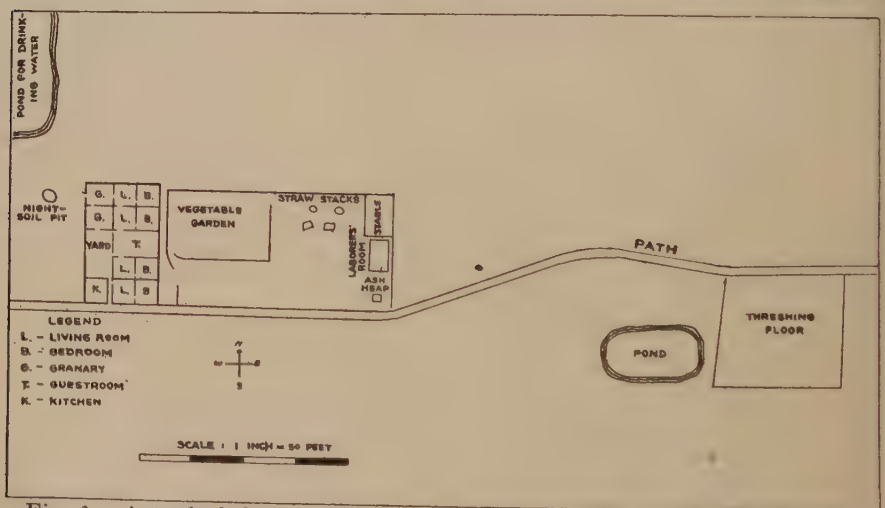

Fig. 1.—A typical farmstead near Chunhwachen, Kiangning Hsien (S), Kiangsu (1928).

The rooms are not well arranged because the length of the house is north and south, thus making it impossible to place many of the rooms on the south side. Even so, the kitchen, which could be on the north side, is located on the south side. If the house had been built so that the present west side faced south and the granary and kitchen moved to some other position, then all the living rooms would face south.

The vegetable garden is placed near the house where it may be carefully watched to prevent the foraging of animals or pilfering. Night soil is stored at one side of the house, but not far from the source of drinking water. The earth threshing floor is situated on the ridge some distance from the residence. This has the advantage of keeping dust from winnowed grain away from the residence and the higher elevation facilitates drying of grain and gives better breezes for the winnowing. The disadvantage is the distance from the main part of the farmstead and, in this respect, the location of threshing floors in this locality is different from that in many regions, for the threshing floor is close to and often in front of the residence and farm buildings, in order that the harvested crops may be conveniently watched.

The plan of this farmstead includes the vegetable garden, stable, laborer's room, and so forth, which are enclosed by a low earth barrier about three feet high. This barrier is built upon the foundation of a former building, destroyed during the Taiping Rebellion. In this section of Kiangning Hsien one is greatly impressed with the number of such foundations of former buildings, many of which, large and well built, still remain entire.

Still another type of farmstead is found at Yenshan Hsien, Chihli, and is shown in fig. 2. This farmstead has a courtyard with the residences on the north opening in a desirable way to the south, and the buildings for farm use on the opposite side of the courtyard. The stable is placed next to the fodder room for convenience. The earth threshing floor, privies, and the well are across the road from the farmstead. Perhaps one of the most needed changes in the farmstead is the placing of privies so as to prevent contamination of water. Where water is boiled the danger is less important but not infrequently the farmer, especially in the summer time, drinks unboiled water; in Yenshan, Chihli, the farmers drink only unboiled water during

the summer, and the privies and wells are in such close proximity that contamination must result.

Other interesting illustrations of farmsteads might be given. In Lienkiang Hsien, Fukien, and in Wusiang Hsien, Shansi, farm buildings have two storeys and the upper one is used for storage of grain and at Wusiang Hsien also for implements and equipment. K'angs, or heated beds, are quite

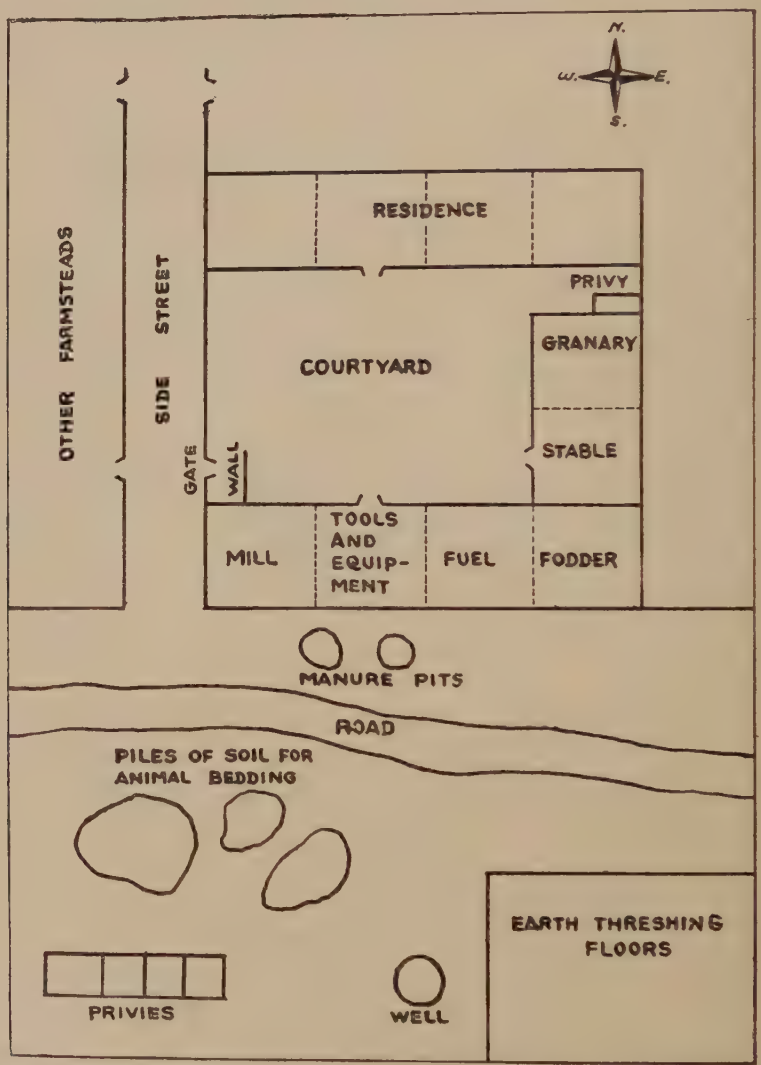

Fig. 2.—A typical farmstead of the better class farmer in Yenshan Hsien, Chihli (1924).

universal in many parts of North China and at Wusiang Hsien the floor of the whole bedroom is raised, and is really the top of a big heating oven. In the winter this room is also the living room much of the time. The cooking stove is at the end where the fire is, and the heat is carried through flues under the raised floor of an earth-lime or, in fewer instances, of brick construction. In Lienkiang Hsien, Fukien, and also in parts of southern Kiangsu, the stable or pig pen and the feed and fodder room are on either side of the entrance to the courtyard, back of which are the living and bedrooms. The guest room is in the center. This arrangement, if only from an esthetic point of view, is very undesirable.

It is quite evident from these examples that a careful study of farmsteads in different regions would be of service in determining what types are best under a given set of conditions. That the arrangement is not always good is quite evident. On the other hand, there are examples of well-planned farmsteads which might be used as models.

THE UTILIZATION OF FARM LAND

Farm land is utilized primarily for the growing of crops but varying proportions are also used for other purposes such as buildings, threshing floors, space for stacks and tethering of animals, paths, roads, ditches, dykes, boundary lines, and graves. The details of how the crop area is utilized by various crops are discussed in the chapter on crops. This particular section will be devoted only to a discussion of the farm area not in crops.

The portion of farm area devoted to purposes other than the growing of crops averages 4.9 per cent for fifteen localities (table 2). This percentage is approximately the same as that of 6.24 per cent for farms in New York State, (1). The smaller farms in China necessitate smaller farmsteads, narrower roads, and the like, but because of the smallness of the farm, the space used for such purposes amounts to a significant proportion of the total farm area. Some of this utilization of space is necessary for conducting the farm business, but some is used for other than farm purposes, such as providing grave land.

Information upon the utilization of the farm area not growing crops was reported for only seven localities in four provinces. In most localities graves occupy part of the farm land

TABLE 2. THE PERCENTAGE OF FARM AREA IN CROPS

2638 farms, 15 localities, seven provinces, China (1921-25)

Provinces and hsiens in which studies were made	Per cent of farm area in crops	Provinces and hsiens in which studies were made	Per cent of farm area in crops
North China		*East Central China*	
Anhwei		**Anhwei**	
Hwaiyuan	94.1	Laian (1921)	96.5
Su	92.5	Laian (1922)	99.8
		Wuhu	98.8
Chihli		**Chekiang**	
Pingsiang	86.6	Chinhai	...
Yenshan (1922)	93.1	**Fukien**	
Yenshan (1923)	92.5	Lienkiang	...
		Kiangsu	
Honan		Kiangning (S)	95.3
Sincheng	97.7	Kiangning (T)	97.5
Kaifeng	96.9	Wuchin	86.9
Shansi			
Wusiang	99.3		
Wutai	98.4	*Average by localities*	*95.8*
Average by localities	*94.6*	*Average by 15 localities*	*95.1*

and in most regions having no hill land they are located in every conceivable position in a field without regard to resulting inconvenience of cultivation. Such grave land is often included in reports of the crop area because the area of the whole field is given without deducting that portion used for graves. The average amount of farm land reported as uncultivated hill or grave land is 0.16 hectares per farm, or 7 per cent of the farm area. At Kiangning Hsien (T), Kiangsu, the amount is 0.72 hectares per farm, or 32.3 per cent because of the large amount of hill land used for graves and for the growing of natural grass and bushes for fuel. A similar condition holds for Kiangning Hsien (S), where topography is much the same but where more pasturing of hills is done because of the distance from Nanking fuel markets and the lack of good transportation facilities (table 3).

The proportion of grave land in cultivated fields to total farm area may be computed for the five localities having only level land (omitting Yenshan Hsien, Chihli, and Kiangning Hsien, (T), Kiangsu,), or land free from wastes upon which

5. *A scene of beauty in the countryside south of Nanking. The buildings and trees belong to a temple. The stone path is typical of East Central China as a main thoroughfare. Considerable land is utilized by ponds, paths, and ditches.*

6. *A typical graveyard of a well-to-do family in North China. It occupies the equivalent of almost a whole field.*

TABLE 3. THE USES OF THAT PORTION OF FARM AREA NOT CULTIVATED

1353 farms, seven localities, four provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Average number of hectares per farm occupied by			Percentage of farm area occupied by		
	Uncultivated land such as hills and grave lands growing grass and bushes for fuel or pasture	Building and threshing floor sites	Ponds, dikes, and paths, or roads	Uncultivated land such as hills and gravelands growing grass and bushes for fuel or pasture	Building and threshing floor sites	Ponds, dikes, and paths, or roads
Anhwei						
Hwaiyuan	0.04	0.04	0.12	1.1	1.1	3.3
Su	0.07	0.11	0.18	1.4	2.3	3.7
Chihli						
Yenshan (1923) ..	0.15	0.04	0.01	4.1	1.1	0.3
Honan						
Sincheng	0.01	0.06	...	0.3	2.0	...
Kaifeng	0.03	0.07	0.01	0.9	2.1	0.3
East Central China						
Kiangsu						
Kiangning (T) ..	0.72	0.06	...	32.3	2.7	...
Wuchin	0.12	0.04	0.01	9.1	3.0	0.8
Average, seven localities	*0.16*	*0.06*	*0.05*	*7.0*	*2.0*	*1.6*

graves might be placed. Accordingly it is found that 2.6 per cent of the farm land is in graves. The highest percentage is 9.1 per cent. on the fertile land of Wuchin Hsien, Kiangsu, where common observation of a large number of graves is thus confirmed.

These percentages may be compared with some obtained by students.[1] In Kweiteh Hsien, Honan, a representative area of 135 fields was selected. Forty-five of these fields contained graves, while ninety had none. The percentage of area occupied by graves is 7.8 per cent. In Wuchin Hsien near Changchow, Kiangsu, in an area of 8.2 square kilometers 5.2 per cent of the crop area is utilized by graves.

1. Wang Ih-chiao, Yu Kwei-fu, and Swen Hu-chen, students in the Department of Agricultural Economics, University of Nanking, obtained these data in the spring of 1929.

The farmstead (buildings and threshing floors) takes up only two per cent of the farm area and the amount of such area is fairly uniform with the exception of Su Hsien, Anhwei, where many large farms were included in the sample. The limited amount of land available for a farm family makes it necessary to confine the farmstead to the smallest possible area.

The area of ponds, dikes, paths, and roads is often difficult to estimate as paths and roads may sometimes be reported in the crop area. The average of such area is 1.6 per cent of the total farm area. It is especially high for Hwaiyuan Hsien and Su Hsien, Anhwei, because of the combined effect of ponds and roads.

The areas occupied by graves, boundary lines, dykes, and the like, cannot be considered as an entire loss from the production standpoint because as a rule the grass there produced is used for pasturing animals, is cut for fodder, or is allowed to grow until the end of the season when it is cut for fuel.

Crop area could be most easily increased by removal of graves and the consolidation of land into fewer pieces so as to remove boundary lines. While the occupation of good farm land by graves is a social custom based largely upon the superstition "fung shui," still it is economically possible because the land is worth more for graves than for the growing of crops. Just as farm land must give way to building lots of growing cities, so does it give way in China to the dying millions.

CHANGES IN SIZE OF FARM

A history of the changes in the amount of land farmed by the operator from the time he began farming until the present was obtained for all localities but four (table 4). But unfortunately, it does not record the change that occurs in the breaking up of farms that are inherited and then divided among the sons, because possession usually takes place not until after that redivision.

At the time the present operators began to farm the size of their farms averaged 2.4 hectares, but now the average size is 2.52 hectares, showing an increase of over one-fifth. No increase in the size of a farm can take place without a corresponding decrease in some other farm unless such increase is from newly deposited soil by rivers or streams, or by the cultivation of arable land formerly not included in the farm area.

7. Hundreds of farmers daily carry loads of fuel (dry grass and bushes) into the city of Nanking.

TABLE 4.—*(Continued)*

Provinces and hsiens in which studies were made	Amount of land (hectares) in the farm diminished by					Net increase or decrease of inherited portion (hectares)								Percentage increase or decrease of farm area over or under inherited portion
	Renting to others	Rented land released	Mortgaging to others	Mortgaged land released	Total	Purchased or sold	Rented by operator as lessor or lessee	Expired rent leases of operator as lessor or lessee	Mortgages of operator as mortgagor or mortgagee	Mortgages redeemed by operator as mortgagor or mortgagee	Land from river deposits	Gifts	Total increase or decrease	
North China														
Anhwei														
Hwaiyuan	0.07	0.01	...	...	0.37	+0.34	+0.11	–0.01	+0.05	...	...	...	+0.49	+15.5
Su	1.16	...	0.02	0.01	1.32	+0.38	+0.77	+0.05	+0.03	+0.06	...	...	+1.29	+35.3
Chihli														
Pingsiang	0.02	...	0.01	...	0.30	–0.10	+0.03	...	+0.10	+0.01	...	...	+0.04	+ 3.6
Yenshan (1922)	...	...	0.23	...	0.48	–0.10	...	...	+0.04	...	...	+0.16	+0.10	+ 4.6
Yenshan (1923)	0.05	...	0.16	0.05	0.64	–0.24	+0.08	+0.07	+0.07	–0.03	+0.01	...	–0.04	– 1.0
Honan														
Sincheng	...	...	...	...	...	+0.29	+0.63	...	+0.01	...	...	...	+0.93	+43.3
Kaifeng	...	...	...	...	0.13	+0.31	+0.46	...	+0.08	...	...	...	+0.85	+34.3
Shansi														
Wusiang	0.09	...	...	...	0.51	–0.10	+0.09	...	+0.23	...	...	...	+0.22	+13.5
Average by localities	*0.17*	...	*0.05*	*0.01*	*0.47*	*+0.09*	*+0.28*	*+0.01*	*+0.08*	—	—	*+0.02*	*+0.48*	*+19.0*
Percentage	...	...	...	...	...	*+18.7*	*+58.3*	*+ 2.1*	*+16.7*	...	...	*+ 4.2*	*100.0*	...
East Central China														
Anhwei														
Laian (1922)	2.09	...	...	...	2.81	–0.02	–1.20	...	+0.12	...	...	...	–1.10	–30.1
Fukien														
Lienkiang	0.03	...	...	...	0.03	+0.16	+0.33	...	...	...	...	...	+0.49	+90.7
Kiangsu														
Kiangning (S)	...	...	...	...	...	+0.58	+0.52	...	+0.15	...	...	...	+1.25	+130.2
Kiangning (T)	0.17	...	0.01	0.01	0.31	+0.12	+1.01	+0.10	+0.03	–0.01	...	...	+1.25	+105.9
Wuchin	0.04	...	...	...	0.09	–0.01	+0.22	...	...	+0.01	...	...	+0.22	+20.2
Average by localities	*0.47*	...	—	—	*0.65*	*+0.17*	*+0.17*	*+0.02*	*+0.06*	—	...	...	*+0.42*	*+28.4*
Percentage	...	...	...	...	...	*+40.5*	*+40.5*	*+ 4.8*	*+14.2*	...	...	...	*100.0*	...
Average by 13 localities	*0.29*	—	*0.03*	*0.01*	*0.54*	*+0.13*	*+0.23*	*+0.02*	*+0.07*	—	—	*+0.01*	*+0.46*	*+21.6*
Percentage	...	...	...	...	...	*+28.3*	*+50.0*	*+ 4.3*	*+15.2*	...	...	*+ 2.2*	*100.0*	...

*These amounts in most cases do not quite equal the inherited portion, plus or minus the net increase or decrease, either because of the influence of the decimal place or possibly because of slightly incomplete reports.

8. *Another method of carrying fuel is by wheel-barrow.*

9. *The rolling topography and the uncultivated hills, typical of much of the region about Nanking, are used for fuel and pasture. The pond in the foreground is a resevoir for irrigating the level rice fields, such as are here shown.*

10 *A small mullberry orchard near Nanking, which had just been pruned in early June. The scattered plot system of land ownership makes watching of the orchard necessary, and the watchman's shelter is in the background.*

The amount of uncultivated arable land formerly not included in the farm area of the various localities, but which has been purchased or possibly rented, is not known. Probably it is not very great.

METHODS OF ACQUIRING OWNERSHIP

Inheritance is the method by which 90 per cent of the farm area with which the operator began to farm is acquired. The succeeding increase in size of farm area is two-fifths by renting land from others, two-fifths from purchases, and one-seventh by mortgaging land from others.

(1) Myers, W. I. An economic study of farm layout. Memoir 34. Cornell University, 1920.

CHAPTER III

THE YEAR'S FARM BUSINESS

Farming is a business in which profits are as essential as in any other, but unfortunately the business principles determining profits are often disregarded. To understand the year's farm business one must know among other things its size, the amount and character of expenses and receipts, and the resulting profits or losses.

THE SIZE OF THE FARM BUSINESS

The size of the farm business may be measured in a number of different ways, chief of which are farm area, crop area, crop hectare area, number of livestock, size of family, man-equivalent, and amount of work accomplished. All of these may be termed physical measures and are easily determined. There are still other factors to indicate size and these are monetary measures. They are amounts of capital investment in the farm enterprise, amounts of receipts and expenses, and profits in a normal year. These items are not so easily determined as are most of the physical measures and with the exception of capital are not often used to determine size of farm business. The discussion, therefore, of capital, receipts, and expenses is confined to the amount and distribution of these items, and profits are dealt with in relation to different measures of profits and to the frequency distribution of one of them, operator's labor earnings, between farms and localities.

Farm Area, Crop Area, and Crop Hectare Area

The total farm area for the 2866 farms is approximately 8500 hectares, or 21,000 acres. The total farm area, crop area, and crop hectares for each locality are shown in table 1.

In studying the size of business some kind of an average must be used for the various measures of size, but there is considerable difference between the mean or arithmetic average and the median for farm area, crop area, and crop hectare area.

TABLE 1. TOTAL FARM AREA, CROP AREA, AND CROP HECTARE AREA

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Farm area (hectares)	Crop area (hectares)	Crop hectare area
North China			
Anhwei			
Hwaiyuan	456.75	429.77	693.25
Su	1380.51	1277.37	2063.27
Chihli			
Pingsiang	173.71	150.17	184.02
Yenshan (1922)	296.40	276.29	422.75
Yenshan (1923)	489.24	452.83	652.86
Honan			
Sincheng	442.01	431.91	733.80
Kaifeng	495.94	479.83	814.46
Shansi			
Wusiang	464.03	461.39	479.84
Wutai	1876.56	1847.58	1847.58
Total	*6075.15*	*5807.14*	*7891.83*
East Central China			
Anhwei			
Laian (1921)	414.57	400.33	474.71
Laian (1922)	253.88	253.17	331.96
Wuhu	171.56	169.37	302.61
Chekiang			
Chinhai	87.52	87.37	97.59
Fukien			
Lienkiang	162.54	162.52	184.05
Kiangsu			
Kiangning (S)	450.03	427.89	846.47
Kiangning (T)	482.87	471.22	733.40
Wuchin	394.27	342.68	613.98
Total	*2417.24*	*2314.55*	*3584.77*
Total by 17 localities	*8492.39*	*8121.69*	*11476.60*

This is caused by the few extremely large farms in almost every locality and by the probable inclusion in a number of localities of a greater proportion of the large farms. This is especially true for the farms studied in Wutai Hsien, Shansi, and occurred in spite of the fact that the investigators were instructed to take a random sample. The frequency distributions

TABLE 2. FREQUENCY DISTRIBUTION OF SIZE OF FARM AREAS
2866 farms, 17 localities, seven provinces, China (1921-1925)

Interval class*	Number of farms in each class interval of five local mow																	
	North China									East Central China								
	Anhwei		Chihli			Honan		Shansi		Anhwei					Kiangsu			
	Hwaiyuan	Su	Pingsiang	Yenshan (1922)	Yenshan (1923)	Sincheng	Kaifeng	Wusiang	Wutai	Laian (1921)	Laian (1922)	Wuhu	Chekiang (Chinhai)	Fukien (Lienkiang)	Kiangning (S)	Kiangning (T)	Wuchin
2.5	5	11	8	3	5	—	—	—	—	—	2	—	—	11	—	1	13
7.5	6	36	28	23	10	1	1	27	—	—	7	12	2	31	8	5	76
12.5	14	16	36	25	7	2	8	45	—	—	5	20	22	39	28	12	43
17.5	12	12	12	25	12	12	7	34	—	2	3	27	21	17	32	16	51
22.5	11	23	32	23	9	24	8	31	—	5	7	15	7	17	24	25	38
27.5	7	17	8	14	10	11	16	23	—	1	1	4	3	15	27	20	30
32.5	8	16	6	11	8	20	13	19	—	5	15	7	4	8	24	27	14
37.5	3	9	7	7	12	9	5	21	1	1	4	3	1	4	13	26	17
42.5	5	20	5	5	7	14	12	13	8	6	13	3	1	1	18	20	8
47.5	6	8	1	2	10	2	7	6	2	1	4	—	4	2	10	23	5
52.5	2	7	1	3	4	13	9	8	22	5	16	4	—	2	1	17	3
57.5	3	4	2	2	4	6	8	4	4	4	1	1	—	2	3	9	—
62.5	10	6	2	1	4	6	9	8	20	11	6	—	—	2	5	7	1
67.5	5	2	1	1	6	2	5	—	8	5	—	—	1	1	1	1	—
72.5	3	8	—	2	4	2	4	1	11	12	3	1	1	1	4	3	—
77.5	4	1	—	—	2	1	2	2	6	2	—	1	—	1	1	—	—
82.5	2	4	1	—	3	5	2	—	4	7	2	—	—	2	1	1	1
87.5	3	—	—	—	5	1	5	2	2	5	—	—	—	1	—	—	—
92.5	1	3	—	—	2	3	4	1	2	9	3	—	—	—	—	1	—
97.5	1	1	—	—	—	—	1	1	1	—	—	—	—	1	—	—	—
102.5	2	13	1	—	—	4	2	1	—	2	—	—	—	—	—	—	—
107.5	—	2	1	—	—	—	2	1	—	1	—	—	—	—	—	1	—
112.5	5	12	—	—	—	1	3	1	—	2	1	2	—	—	—	—	—
117.5	—	4	—	1	—	—	—	1	2	3	—	1	—	—	—	1	—
122.5	1	17	—	—	2	—	5	—	2	7	4	1	—	1	2	—	—
127.5	2	1	—	—	—	—	2	—	2	1	—	—	—	—	—	—	—
132.5	—	9	—	—	1	2	—	—	3	1	—	—	—	—	—	—	—
137.5	—	1	—	—	—	—	1	—	7	—	—	—	—	—	—	1	—
142.5	1	3	—	—	—	—	2	—	10	1	1	—	—	—	1	—	—
147.5	—	—	—	—	—	—	1	—	6	—	—	—	—	—	—	—	—
152.5	—	1	—	—	3	—	2	—	7	—	1	—	—	—	—	—	—
157.5	—	—	—	—	—	—	2	—	7	—	—	—	—	—	—	—	—
162.5	1	4	—	—	2	1	1	—	2	—	—	—	—	—	—	—	—
167.5	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—
172.5	—	1	—	2	—	—	—	—	10	—	—	—	—	—	—	—	—
177.5	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—
182.5	—	2	—	—	—	2	—	—	15	—	1	—	—	—	—	—	—
187.5	—	—	—	—	—	—	—	1	5	—	—	—	—	—	—	—	—
192.5	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—
197.5	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—
200 and over†	1	12	—	—	1	—	—	—	38	2	—	—	—	2	—	—	—

*The class interval is designated by the midpoint; for instance, 2.5 is the midpoint of the 0–4.9 interval, 7.5 the midpoint of the 5–9.9 interval, and so on. The total number of farms in each interval for North and for East Central China and for all localities is not given because the size of mow varies in each locality.

†Farms of 200 or more mow are omitted to save space and because of the few farms above this size. The largest farm is in the 330–334.9 class.

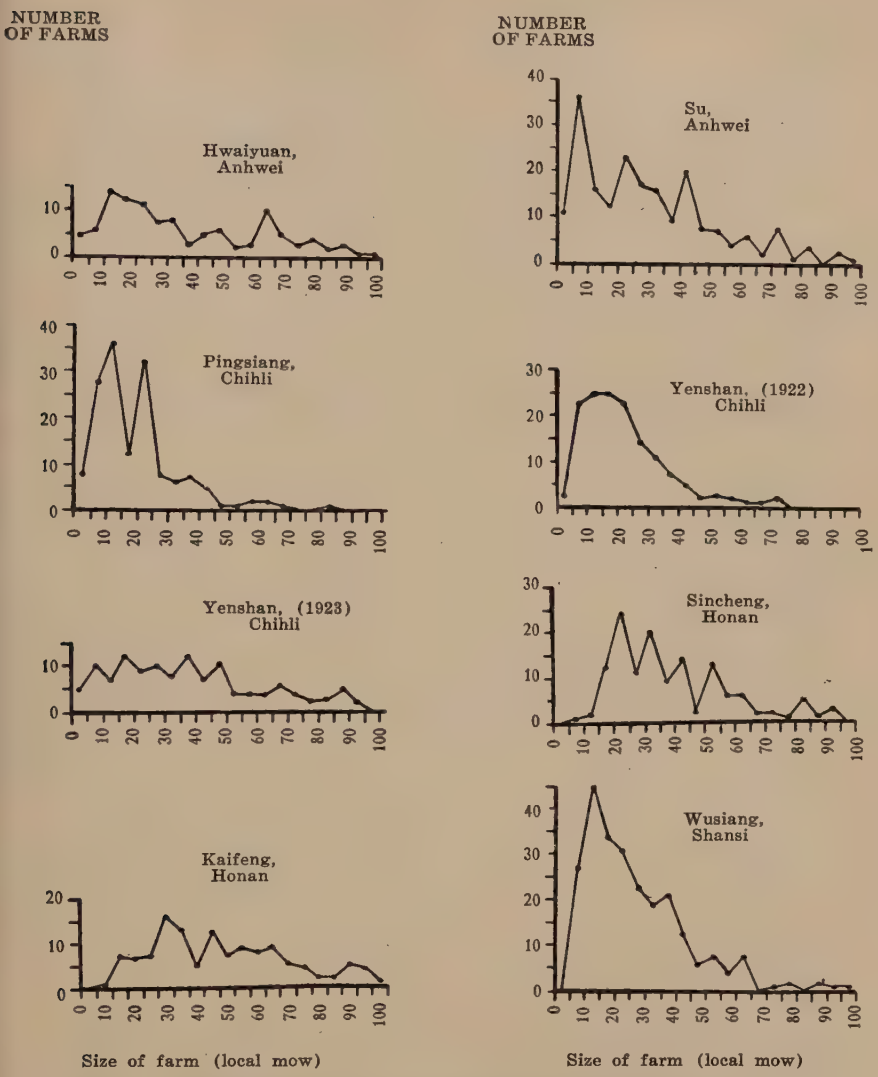

Fig. 1.—Frequency distribution of farm area (in local mow) for 1389 North China farms (1922-1925).

The entire curve is not shown for localities having farms over 100 mow because of the few farms of such sizes. The number and size of such farms may be found in table 2.

of farm area give a fair idea of the kind of samples obtained (table 2, figs. 1-3). In general, the localities having elongated curves are the ones where the farms were scattered in many villages and the particular farms studied were determined by

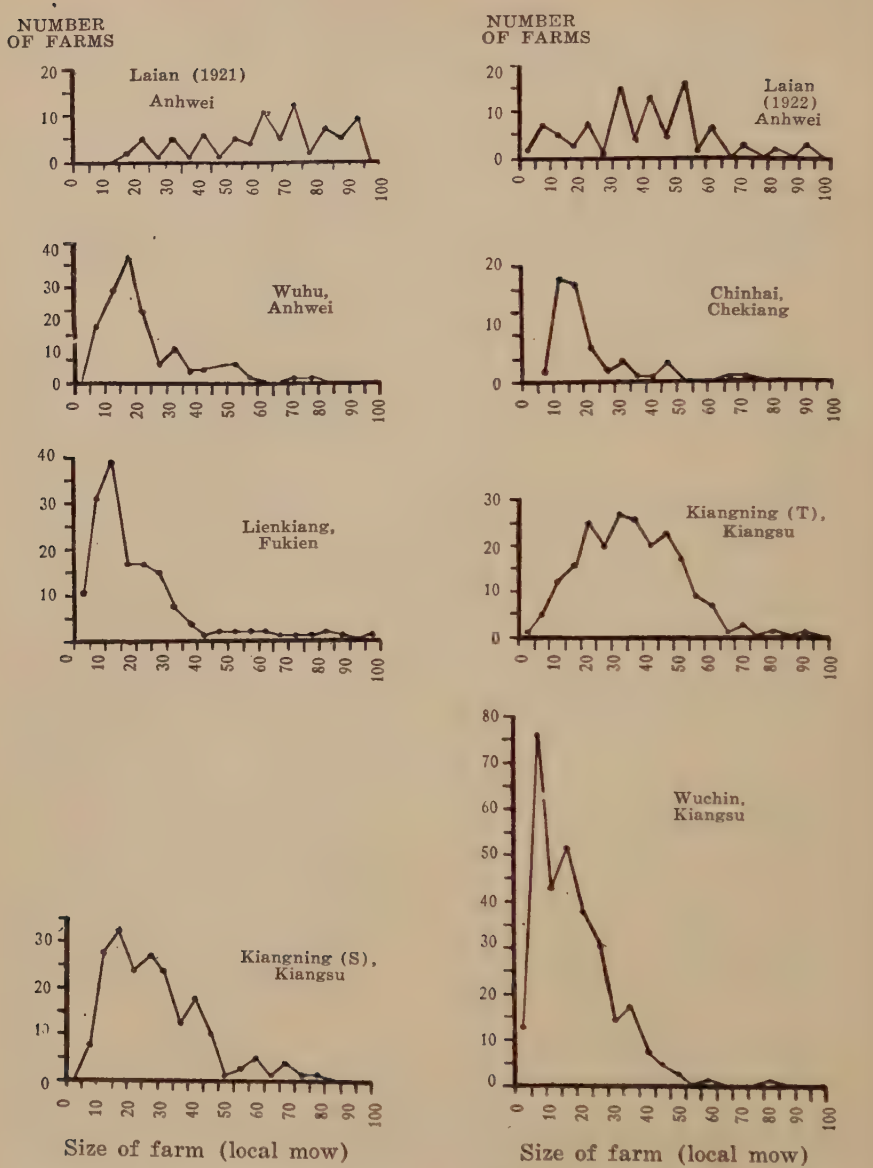

Fig. 2.—Frequency distribution of farm area (in local mow) for 1251 East Central China farms (1921-1924).

The entire curve is not shown for localities having farms over 100 mow because of the few farms of such sizes. The number and size of such farms may be found in table 2.

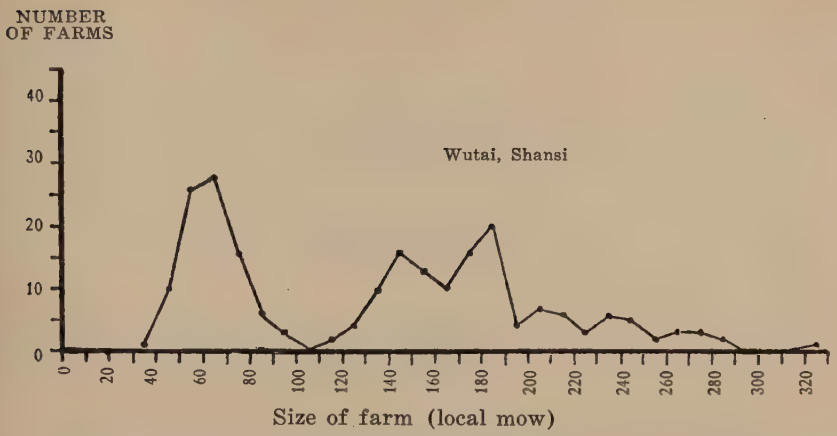

Fig. 3.—Frequency distribution of farm area (in local mow) for 226 farms, Wutai, Shansi, China 1922-1923).

blood relationship or friendship of the investigator to the operator, or by introduction of the investigator to the operator by friends or relatives. Because of the necessity of such an approach if accurate data were to be obtained, it is probable that there has been a selection in favor of the more progressive farmers and often of larger farms. These curves should be studied together with the information on sources of data in table 2, chapter I.

The mode has not been used as a measure of size, chiefly because of its possible variation in position and because several values often approximate the value actually appearing the greatest number of times. However, the curves showing frequency distributions by five-mow class intervals do indicate for a number of localities distinct modal groups.

The different results obtained by the use of the mean and the median as an average for farm area, crop area, and crop hectare area are shown in table 3. The median is the better average to use in judging size and in making comparisons with other localities and other countries because the effect of a few large farms is eliminated.

The larger farm area, crop area, and crop hectare area in North China, compared with East Central China, are chiefly accounted for by differences in climate, topography, and soils (fig. 4).

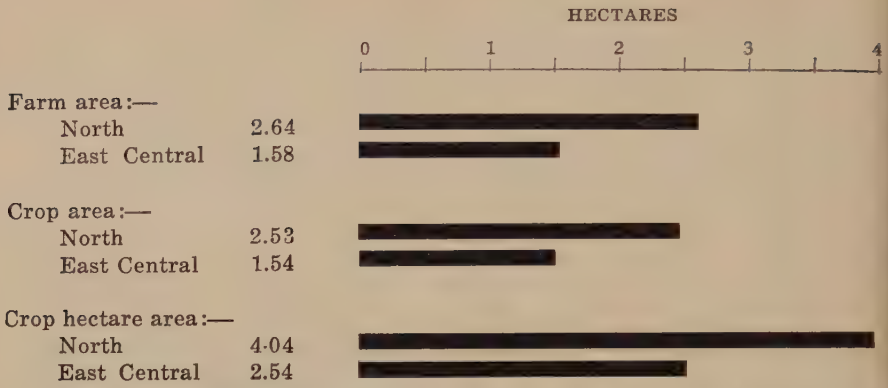

Fig. 4.—A comparison of farm area, crop area and crop hectare area per farm in North and East Central China.

2866 farms, 17 localities, seven provinces, China (1921-1925).

Farm Area

The size of farm is commonly denoted by the amount of farm area. It is a fairly reliable indicator of size when comparing farms within a single type of farming area. For the seventeen localities the average farm area as expressed by the median is 2.13 hectares. If the farms surveyed in Wutai Hsien, Shansi, are omitted, then the median is 2.04, or approximately five acres. Since the farms in some of the other localities may also be larger than the average for the locality, it is well to think of the farms in the localities represented in this study as being not over five acres in size and to realize that for China as a whole the size of farm is probably well under five acres.

Crop Area

Crop area is a slightly better measure than farm area since the land devoted to buildings and other parts of the farmstead and to roads, paths, ditches, and dykes are eliminated. Crop area for all localities is represented by the median of 2.13 hectares, or 5.26 acres (table 3). The smallest crop areas for any one locality are found at Lienkiang Hsien, Fukien, where the land is very fertile and where the median is 0.60 hectares per farm. Crop areas nearly as small as this, however, averaging 0.79 hectares per farm, are found at Pingsiang Hsien, Chihli, where much of the land is irrigated in contrast to no irrigation in other North China localities.

In comparing the size of business in various countries data for the amount of double cropping do not exist and this makes impossible the use of the better measure of size, crop hectare area; failing this, therefore, crop area may be taken as the measure (fig. 5). In such comparison it should be remembered that intensiveness of farming, the type of crops grown, and the extent of animal industry affect size and that these in turn are largely dependent upon density of population. It is evident that the size of farm business in China as measured by crop area is small, although still nearly two times greater than for farms in Japan.

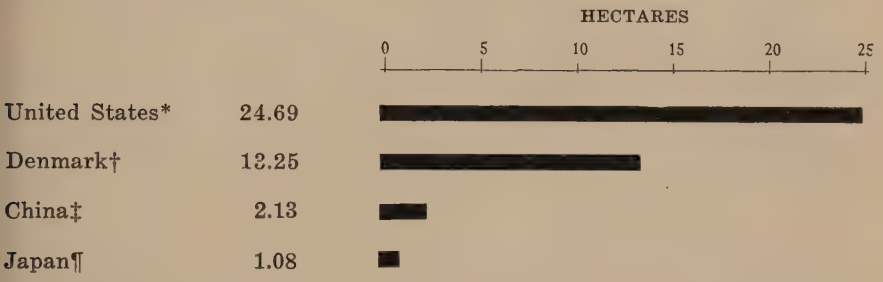

Fig. 5.—A comparison by countries of crop areas per farm.

*The statistical abstract of the United States. U.S. Dept. of Commerce, Washington, 1928.

†Hertel H. A short survey of agriculture in Denmark. The Royal Danish Agricultural Society, Copenhagen, Denmark.

‡2866 farms, 17 localities, seven provinces, China (1921-1925).

¶An outline of agriculture in Japan. Ministry of Agriculture and Forestry, Tokio, Japan, 1925.

Crop Hectare Area

The crop area in North China is greater than in East Central China but it fails to measure exactly differences in size of farm business for the two regions because it does not take into account the climatic factors which make possible the growing of more than one crop during the same year. The apparent difference in size between the two regions is therefore reduced when the measure of crop hectare area is used. The median crop hectare area for the seventeen localities is 3.18 hectares or 7.85 acres of crops; in North China it is 4.04 hectares as compared with 2.54 hectares in East Central China. The mean crop hectare area for all localities is 3.86 hectares, over one-fifth greater than the median (table 3). Crop hectare area and the index of double cropping (crop hectare area divided by crop area) when correlated together show that

TABLE 3. THE MEANS AND MEDIANS OF FARM AREA, CROP AREA, AND CROP HECTARE AREA*

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Farm area (hectares)		Crop area (hectares)		Crop hectare area†	
	Mean	Median	Mean	Median	Mean	Median
North China						
Anhwei						
Hwaiyuan	3.68	2.64	3.47	2.53	5.59	4.20
Su	4.83	3.16	4.46	2.80	7.21	5.14
Chihli						
Pingsiang	1.14	0.87	0.99	0.79	1.21	1.02
Yenshan (1922)	1.98	1.53	1.84	1.49	2.82	2.18
Yenshan (1923)	3.68	2.91	3.41	2.75	4.91	4.04
Honan						
Sincheng	3.07	2.44	3.00	2.39	5.10	3.77
Kaifeng	3.33	2.79	3.22	2.67	5.47	4.59
Shansi						
Wusiang	1.85	1.50	1.84	1.43	1.91	1.50
Wutai	8.30	8.81	8.17	8.69	8.17	8.69
Average by localities.	*3.54*	*2.64*	*3.38*	*2.53*	*4.71*	*4.04*
East Central China						
Anhwei						
Laian (1921)	4.11	3.92	3.96	3.86	4.70	4.69
Laian (1922)	2.54	2.26	2.53	2.23	3.32	2.98
Wuhu	1.68	1.21	1.66	1.21	2.97	2.09
Chekiang						
Chinhai ‡	1.30	1.00	1.30	1.30	1.45	1.19
Fukien						
Lienkiang §	1.01	0.60	1.01	0.60	1.14	0.73
Kiangsu						
Kiangning (S)	2.21	1.94	2.11	1.86	4.17	3.73
Kiangning (T)	2.23	2.13	2.13	2.13	3.38	3.18
Wuchin	1.32	1.15	1.14	1.04	2.05	1.94
Average by localities	*2.05*	*1.58*	*1.98*	*1.54*	*2.54*	*2.54*
Average by 17 localities	*2.84*	*2.13*	*2.72*	*2.13*	*3.86*	*3.18*

*Shade or timber trees amounting to 0.01 hectares per farm for each of the hsiens of Hwaiyuan, Su and Yenshan, (1923) have not been included in these areas. Fruit trees occupying an area of 0.06 per farm for Yenshan Hsien (1923) have also been omitted.

†Crop hectare area is the number of hectares of various crop grown. It is greater than the crop area because some land grows two or more crops each year.

‡Farm areas for this locality were not reported but crop area has been substituted under the farm area in order to obtain as representative an average as possible for the 17 localities.

§The crop hectare area is smaller than one might except because early and late rice, which is interplanted, is taken as one crop although the two varieties are planted and harvested at different periods.

the latter does not measure size since the average of the gross correlation coefficients, which are all positive, is only +.158 (appendix II, table 1). A further discussion of index of double cropping is given in the chapter on crops.

Comparing the crop hectare area in the size-groups of farms, it is only natural that it should increase with the size of farm.[1] For all localities the average crop hectare area in the small size-group is 1.35 compared with 7.63 hectares in the large size-group. Four localities show areas between eight and

TABLE 4. RELATION OF SIZE OF FARM TO CROP HECTARE AREA PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Crop hectares per farm for farms grouped by size of farm area						Ratios of crop hectares per farm for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	1.36	3.39	5.75	8.55	13.24	5.59	100	249	423	629	974
Su	1.56	...	5.49	...	15.23	7.21	100	...	352	...	976
Chihli											
Pingsiang	0.46	...	0.98	...	2.09	1.21	100	...	213	...	454
Yenshan (1922)	0.99	1.84	...	2.95	5.76	2.82	100	186	...	298	582
Yenshan (1923)	1.49	...	4.13	...	9.31	4.91	100	...	277	...	625
Honan											
Sincheng	2.19	3.86	...	6.49	12.20	5.10	100	176	...	296	557
Kaifeng	1.56	3.41	...	5.78	10.65	5.47	100	219	...	371	683
Shansi											
Wusiang	0.52	1.00	1.69	2.45	4.27	1.91	100	192	325	471	821
Wutai	3.07	5.34	9.48	10.96	14.69	8.17	100	174	309	357	479
Average by localities	*1.47*	...	*4.13**	...	*9.72*	*4.71*	*100*	...	*281*	...	*661*
East Central China											
Anhwei											
Laian (1921)	2.43	4.04	...	5.10	6.87	4.70	100	166	...	210	283
Laian (1922)	1.41	...	2.99	...	5.73	3.32	100	...	212	...	406
Wuhu	0.88	1.87	...	2.94	7.26	2.97	100	213	...	334	825
Chekiang											
Chinhai	0.84	...	1.17	...	2.45	1.45	100	...	139	...	292
Fukien											
Lienkiang	0.36	...	0.81	...	2.40	1.14	100	...	225	...	667
Kiangsu											
Kiangning (S)	1.60	2.71	...	4.11	7.44	4.17	100	169	...	257	465
Kiangning (T)	1.50	2.37	3.16	4.04	5.58	3.38	100	158	211	269	372
Wuchin	0.75	1.72	2.70	3.82	4.59	2.05	100	229	360	506	612
Average by localities	*1.22*	...	*2.58**	...	*5.29*	*2.90*	*100*	...	*211*	...	*434*
Average by 17 localities	*1.35*	...	*3.40**	...	*7.63*	*3.86*	*100*	...	*252*	...	*565*

*In obtaining this average, those places having farms in the medium small, medium and medium large groups are all classified under medium.

[1] The method of grouping is discussed at the beginning of the next chapter.

ten times greater in the large size-group, six localities five to eight times greater, and seven localities 2.8 to five times greater (table 4). The relative difference is larger in North China because the farms in the large size-group in East Central China are relatively smaller than farms in the same group in North China. That farms do not vary so much in size in East

TABLE 5. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF CROP HECTARE AREAS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	5.59±0.27	4.20±0.34	4.46±0.19	79.79±5.16
Su	7.21±0.27	5.14±0.34	6.66±0.19	92.37±4.28
Chihli				
Pingsiang	1.21±0.06	1.02±0.08	1.08±0.04	89.26±5.57
Yenshan (1922) .	2.82±0.13	2.18±0.16	2.42±0.09	85.82±5.26
Yenshan (1923) .	4.91±0.23	4.04±0.29	4.00±0.17	81.47±5.14
Honan				
Sincheng	5.10±0.20	3.77±0.25	3.48±0.14	68.24±3.76
Kaifeng	5.47±0.20	4.59±0.25	3.53±0.14	64.53±3.41
Shansi				
Wusiang	1.91±0.07	1.50±0.09	1.52±0.05	79.58±3.61
Wutai	8.17±0.19	8.69±0.24	4.18±0.13	51.16±2.00
Average by localities	*4.71*	*4.04*	*3.48*	*76.91*
East Central China				
Anhwei				
Laian (1921) ..	4.70±0.13	4.69±0.16	1.90±0.09	40.43±2.20
Laian (1922) ..	3.32±0.15	2.98±0.19	2.15±0.10	64.76±4.18
Wuhu	2.97±0.19	2.09±0.24	2.80±0.13	94.28±7.42
Chekiang				
Chinhai	1.45±0.07	1.19±0.09	0.89±0.05	61.38±4.74
Fukien				
Lienkiang	1.14±0.08	0.73±0.10	1.44±0.05	126.32±9.69
Kiangsu				
Kiangning (S) ..	4.17±0.13	3.73±0.16	2.79±0.09	66.91±3.09
Kiangning (T) ..	3.38±0.07	3.18±0.09	1.59±0.05	47.04±1.83
Wuchin	2.05±0.05	1.94±0.06	1.27±0.03	61.95±2.27
Average by localities	*2.90*	*2.54*	*1.85*	*70.38*
17 localities ..	*3.86*	*3.18*	*2.72*	*73.84*

Central China as in North China is also shown by the coefficient of variation, which is 76.91 for North China and 70.38 for East Central China (table 5).

Man-Equivalent Per Farm

Man-equivalent is a unit used to represent the work done by persons engaged in agriculture either for the full year or

TABLE 6. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF MAN-EQUIVALENT

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	2.21±0.07	2.00±0.09	1.22±0.05	55.20±3.00
Su	1.75±0.05	1.52±0.06	1.30±0.04	74.29±3.04
Chihli				
Pingsiang	1.39±0.04	1.10±0.05	0.66±0.03	47.48±2.21
Yenshan (1922)	1.54±0.05	2.97±0.06	0.84±0.03	54.55±2.68
Yenshan (1923)	1.85±0.05	1.75±0.06	0.93±0.04	50.27±2.55
Honan				
Sincheng	3.55±0.09	3.10±0.11	1.69±0.07	47.61±2.28
Kaifeng	2.47±0.06	2.40±0.08	1.08±0.04	43.72±2.01
Shansi				
Wusiang	1.21±0.03	1.10±0.04	0.59±0.02	48.76±1.78
Wutai	2.64±0.03	3.00±0.04	0.61±0.02	23.11±0.77
Average by localities	*2.07*	*2.00*	*0.99*	*49.44*
East Central China				
Anhwei				
Laian (1921)	4.67±0.11	4.30±0.14	1.58±0.08	33.83±1.78
Laian (1922)	3.22±0.07	3.10±0.09	1.00±0.05	31.06±1.62
Wuhu	2.97±0.14	2.30±0.18	2.08±0.10	70.03±4.65
Chekiang				
Chinhai	1.78±0.07	1.40±0.09	0.84±0.05	47.19±3.31
Fukien				
Lienkiang	1.68±0.06	1.30±0.08	1.05±0.04	62.50±3.14
Kiangsu				
Kiangning (S)	1.86±0.05	2.00±0.06	1.12±0.04	60.22±2.65
Kiangning (T)	3.17±0.06	3.05±0.08	1.41±0.05	44.48±1.70
Wuchin	1.01±0.02	0.89±0.03	0.64±0.02	63.37±2.34
Average by localities	*2.55*	*2.15*	*1.22*	*51.59*
Average by 17 localities	*2.29*	*2.00*	*1.10*	*50.45*

for only part time. It is equivalent to one man working on the farm for twelve months.

The average number of man-equivalents for the seventeen localities is 2.29 when the arithmetic average is used, and is exactly 2.00 for the median (table 6). The number of man-equivalent, is, however, quite variable, as is shown by the coefficient of variability, 50.45 per cent (table 6), although it is still less variable than many of the other factors. The range of variability between localities is also not very great. If it were not for differences in the amount of available farm labor because of the varying size of the farm family, the coefficient of variability would be still lower.

TABLE 7. RELATION OF SIZE OF FARM TO MAN-EQUIVALENT PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Man-equivalent per farm for farms grouped by size of farm						Ratios of man-equivalent per farm for different size-groups to the small size-groups				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	1.21	1.79	2.41	2.69	3.98	2.21	100	148	199	222	329
Su	0.84	...	1.59	...	2.94	1.75	100	...	189	...	350
Chihli											
Pingsiang	1.01	...	1.22	...	1.87	1.39	100	...	121	...	185
Yenshan (1922)	0.89	1.27	...	1.54	2.49	1.54	100	143	...	173	280
Yenshan (1923)	1.02	...	1.74	...	2.83	1.85	100	...	171	...	277
Honan											
Sincheng	2.48	3.23	...	4.34	5.37	3.55	100	130	...	175	217
Kaifeng	1.38	1.80	...	2.72	3.89	2.47	100	130	...	197	282
Shansi											
Wusiang	0.77	0.95	1.15	1.26	2.00	1.21	100	123	149	164	260
Wutai	2.10	2.26	2.85	3.08	3.22	2.64	100	108	136	147	153
Average by localities	*1.30*	...	*1.96**	...	*3.18*	*2.07*	*100*	...	*151*	...	*245*
East Central China											
Anhwei											
Laian (1921)	3.14	4.18	...	4.69	6.42	4.67	100	133	...	149	204
Laian (1922)	2.28	...	3.32	...	4.06	3.22	100	...	146	...	178
Wuhu	1.48	2.20	...	3.01	5.95	2.97	100	149	...	203	402
Chekiang											
Chinhai	1.23	...	1.48	...	2.70	1.78	100	...	120	...	220
Fukien											
Lienkiang	1.14	...	1.39	...	2.61	1.68	100	...	122	...	229
Kiangsu											
Kiangning (S)	1.12	1.20	...	1.82	3.05	1.86	100	107	...	163	272
Kiangning (T)	1.66	2.48	3.00	3.69	4.81	3.17	100	149	181	222	290
Wuchin	0.43	0.90	1.26	1.81	2.22	1.01	100	209	293	421	516
Average by localities	*1.56*	...	*2.34**	...	*3.98*	*2.55*	*100*	...	*150*	...	*255*
Average by 17 localities	*1.42*	...	*2.14**	...	*3.55*	*2.29*	*100*	...	*151*	...	*250*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

The number of man-equivalents per farm increases with increase in size of farm because the more work there is to be done the greater is the number of persons required. The association is not perfect because the varying size of family as well as varying efficiency in management cause more labor or less to be used for equal sized farms. Man-equivalents average 1.42 on farms in the small size-group compared with 3.55 on farms in the large size-group (table 7). The relationship between groups is quite similar in both North and East Central China. The degree of association between size of farm and man-equivalents, where crop mow is used to indicate size of farm, is shown by gross correlation coefficients which are marked for three localities, high for twelve localities, and very close for two localities. The coefficients for the seventeen localities average +.787 a high degree of association (appendix II, tables 1 and 2). Man-equivalent, therefore, is a fairly good measure of size of farm.

The Size of Family

The size of the family in rural China is in some localities a fair measure of the size of the farm business. This is true because there is a marked association between the size of farm and the size of family. The number of adult-male units in the large size-group of farms is almost exactly twice those in the small size-group (table 7, chapter IX). This relationship is more fully explained in the discussion of size of farm and size of family in the chapter on the farm family and population.

Amount of Work Accomplished

The amount of productive work done in growing crops and raising animals is the best indication of size because it measures the type and the intensiveness of farming. A small truck farm growing several crops of vegetables a year may be just as large or even a larger business than one with several times the acreage growing cereals. For this reason the man-work unit is used to measure the average amount of productive work performed by the farmers of a community in a ten-hour day. The animal-work unit is the amount of productive work done on the average by a labor animal in a ten-hour day. No mechanical power of any kind was used in any of the arts

studied, although there are places in China where wind power, engine power, and water-wheel power are used for irrigation purposes.

The man-work unit or the animal-work unit, while a good measure of size of farm business in a given country where agri-

TABLE 8. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF MAN-WORK UNITS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	247.1±11.58	185.9±14.51	191.08± 8.18	77.33± 4.90
Su	280.9± 9.54	199.0±11.96	239.22± 6.75	85.16± 3.76
Chihli				
Pingsiang	77.9± 4.10	58.1± 5.14	75.01± 2.90	96.29± 6.29
Yenshan (1922) .	141.2± 6.63	108.7± 8.31	120.24± 4.68	85.16± 5.18
Yenshan (1923) .	236.9±10.97	197.5±13.75	187.60± 7.77	79.19± 4.92
Honan				
Sincheng	236.9± 8.87	179.9±11.12	157.88± 6.27	66.64± 3.64
Kaifeng	223.6± 7.92	190.4± 9.93	143.26± 5.60	64.07± 3.38
Shansi				
Wusiang	146.7± 4.68	118.0± 5.87	109.80± 3.30	74.85± 3.28
Wutai	635.7±14.48	683.4±18.15	322.48±10.22	50.73± 1.98
Average by localities	*247.4*	*185.9*	*171.84*	*75.49*
East Central China				
Anhwei				
Laian (1921) ..	514.2±13.06	500.9±16.37	194.61± 9.24	37.85± 2.04
Laian (1922) ..	353.2±14.01	309.5±17.56	207.58± 9.90	58.77± 3.64
Wuhu	268.2±16.73	188.8±20.97	250.51±11.82	93.40± 7.30
Chekiang				
Chinhai	262.0±12.51	207.7±15.68	151.87± 8.85	57.97± 4.37
Fukien				
Lienkiang	231.9±14.87	150.7±18.64	279.47±10.51	120.50± 8.95
Kiangsu				
Kiangning (S) ..	276.8± 7.91	240.2± 9.91	167.33± 5.61	60.45± 2.66
Kiangning (T) ..	390.5± 9.71	352.8±12.17	212.00± 6.87	54.29± 2.22
Wuchin	156.6± 3.83	146.0± 4.80	98.46± 2.71	62.87± 2.31
Average by localities	*306.7*	*224.0*	*195.23*	*68.26*
Average by 17 localities ..	*275.3*	*190.4*	*182.85*	*72.09*

cultural practice is similar, must be used with care for comparing size of business between countries where agricultural practice differs. For instance, a man cutting wheat with a sickle accomplishes an infinitesimal amount of work when compared with a man using a reaper-binder.

Man-work units.—For all the farms the total number of man-work units averages 275 per farm, while the median number, a better average in this case, is 190 per farm (table 8). The farm family can hardly expect to have sufficient income when the family members, together with hired labor, only spend

TABLE 9. RELATION OF SIZE OF FARM TO NUMBER OF MAN-WORK UNITS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NUMBER OF MAN-WORK UNITS PER FARM FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF MAN-WORK UNITS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUPS				
	Small	Medium small	Medium	Medium large	Large	Average for all farms	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	68.3	150.6	249.6	377.9	572.2	247.1	100	220	365	553	838
Su	78.3	...	224.0	...	563.5	280.9	100	...	286	...	720
Chihli											
Pingsiang	31.4	...	62.3	...	133.7	77.9	100	...	198	...	426
Yenshan (1922)	49.8	93.3	...	146.8	287.5	141.2	100	187	...	295	577
Yenshan (1923)	76.9	...	201.1	...	441.7	236.9	100	...	262	...	574
Honan											
Sincheng	105.4	181.0	...	298.3	560.9	236.9	100	172	...	283	532
Kaifeng	63.4	141.1	...	236.2	433.9	223.6	100	223	...	373	684
Shansi											
Wusiang	45.6	82.2	131.1	186.7	313.9	146.7	100	180	288	409	688
Wutai	242.1	415.7	742.1	850.7	1133.4	635.7	100	172	307	351	468
Average by localities	*84.6*	...	*221.6**	...	*493.4*	*247.4*	*100*	...	*262*	...	*583*
East Central China											
Anhwei											
Laian (1921)	263.7	441.6	...	557.3	755.4	514.2	100	167	...	211	286
Laian (1922)	176.3	...	313.1	...	587.9	353.2	100	...	178	...	333
Wuhu	84.2	169.0	...	265.5	652.6	268.2	100	201	...	315	775
Chekiang											
Chinhai	159.7	...	212.4	...	428.3	262.0	100	...	133	...	268
Fukien											
Lienkiang	74.8	...	170.8	...	475.0	231.9	100	...	228	...	635
Kiangsu											
Kiangning (S)	165.4	172.8	...	263.8	465.0	276.8	100	104	...	159	281
Kiangning (T)	154.1	255.5	356.4	485.4	672.3	390.5	100	166	231	315	436
Wuchin	56.5	131.9	207.1	296.1	349.7	156.6	100	233	367	524	619
Average by localities	*141.8*	...	*268.6**	...	*543.3*	*306.7*	*100*	...	*189*	...	*387*
Average by 17 localities	*111.5*	...	*243.7**	...	*519.2*	*275.3*	*100*	...	*219*	...	*466*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

the equivalent of 190 ten-hour days of work directly upon the raising of crops or animals. The variability of man-work units is considerable and is almost the same as for crop hectares per farm. The standard deviation is 182.85 work units while the coefficient of variability is 72.09 per cent (table 8).

Man-work units show a smaller degree of association between the various size-groups than do crop hectares because

TABLE 10. PER CENT OF FARMS HAVING LABOR ANIMALS IN THE SPECIFIED SIZE-GROUP OF FARMS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Small	Medium small	Medium	Medium large	Large
North China					
Anhwei					
Hwaiyuan	43.2	100.0	100.0	100.0	100.0
Su	51.4	...	98.9	...	100.0
Chihli					
Pingsiang	10.4	...	30.0	...	48.1
Yenshan (1922)	12.1	72.9	...	100.0	100.0
Yenshan (1923)	17.8	...	93.3	...	100.0
Honan					
Sincheng	94.9	98.2	...	100.0	90.0
Kaifeng	91.7	100.0	...	100.0	100.0
Shansi					
Wusiang	0	67.1	100.0	100.0	100.0
Wutai	100.0	100.0	100.0	100.0	100.0
Average by localities	*46.8*	...	*87.7**	...	*93.1*
East Central China					
Anhwei					
Laian (1921)	22.7	100.0	...	100.0	100.0
Laian (1922)	45.2	...	100.0	...	100.0
Wuhu	7.1	82.4	...	100.0	100.0
Chekiang					
Chinhai	0	...	60.9	...	100.0
Fukien					
Lienkiang	33.9	...	74.5	...	88.0
Kiangsu					
Kiangning (S)	35.7	75.9	...	100.0	100.0
Kiangning (T)	8.8	33.3	43.4	81.4	92.9
Wuchin	7.9	81.9	100.0	100.0	100.0
Average by localities	*20.2*	...	*81.6**	...	*97.6*
Average by 17 localities	*34.3*	...	*84.8**	...	*95.2*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

such units measure work actually performed. The average number of man-work units per farm in the small size-group is 112 compared with 519 for farms in the large size-group (table 9). For North China the number in large size farms is 5.8 times greater than on small size farms, but only 3.9 times greater in East Central China, showing that the difference between sizes of farm business is larger in North China than in East Central China. This is caused by a relatively smaller number of man-work units in the small size-groups of North China.

TABLE 11. RELATION OF SIZE OF FARM TO ANIMAL-WORK UNITS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	ANIMAL-WORK UNITS PER FARM FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF ANIMAL-WORK UNITS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	25.9	49.0	83.4	126.1	193.7	95.3	100	189	322	487	748
Su	30.9	...	76.1	...	230.9	127.2	100	...	246	...	747
Chihli											
Pingsiang	11.8	...	21.2	...	45.9	34.1	100	...	180	...	389
Yenshan (1922)	20.4	30.0	...	46.0	90.9	54.4	100	147	...	225	446
Yenshan (1923)	33.5	...	64.3	...	140.8	97.0	100	...	192	...	420
Honan											
Sincheng	57.4	97.9	...	165.3	319.8	129.9	100	171	...	288	557
Kaifeng	58.7	125.4	...	211.4	385.0	198.5	100	214	...	360	656
Shansi											
Wusiang	†	26.8	41.0	57.8	95.9	54.1	...	...	...	...	...
Wutai	79.2	131.6	232.8	259.1	357.3	199.3	100	166	294	327	451
Average by localities	*35.3*	...	*88.5**	...	*206.7*	*110.0*	*100*	...	*251*	...	*586*
East Central China											
Anhwei											
Laian (1921)	70.3	102.5	...	128.8	178.1	132.4	100	146	...	183	253
Laian (1922)	48.1	...	73.4	...	142.5	94.1	100	...	153	...	296
Wuhu	10.2	16.3	...	24.7	60.3	29.0	100	160	...	242	591
Chekiang											
Chinhai	†	...	85.6	...	181.5	143.1	...	...	...	...	...
Fukien											
Lienkiang	17.3	...	33.9	...	91.9	55.4	100	...	196	...	531
Kiangsu											
Kiangning (S)	14.3	24.3	...	33.9	59.7	38.9	100	170	...	237	417
Kiangning (T)	10.0	11.8	12.6	15.4	20.2	15.9	100	118	126	154	202
Wuchin	13.6	21.8	32.8	47.5	58.3	32.5	100	160	241	349	429
Average by localities	*23.0*	...	*50.0**	...	*99.1*	*67.7*	*100*	...	*217*	...	*431*
Average by 17 localities	*29.5*	...	*70.4**	...	*156.0*	*90.1*	*100*	...	*239*	...	*529*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

†No labor animals are kept on these farms.

Animal-work units.—Animal-work units are an inadequate measure of size of farm business, first because many farmers, especially on small farms, do not keep animals but hire or borrow them from neighbors or relatives; second, in some regions little work is done by animals, the soil being dug and prepared by hand tools, and, third, proportionately more

TABLE 12. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF ANIMAL-WORK UNITS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	95.3±3.85	79.7±4.83	63.58±2.72	66.72±3.93
Su	127.2±4.02	84.1±5.04	100.71±2.84	79.17±3.35
Chihli				
Pingsiang	34.1±1.48	26.9±1.85	27.11±1.05	79.50±4.63
Yenshan (1922)	54.4±2.25	43.8±2.82	40.87±1.59	75.13±4.26
Yenshan (1923)	97.0±3.43	79.0±4.30	58.64±2.43	60.45±3.29
Honan				
Sincheng	129.9±5.11	101.3±6.40	90.85±3.61	69.94±3.91
Kaifeng	198.5±7.21	174.3±9.04	130.31±5.10	65.65±3.50
Shansi				
Wusiang	54.1±1.47	45.5±1.84	34.60±1.04	63.96±2.59
Wutai	199.3±4.56	215.1±5.72	101.61±3.22	50.98±1.99
Average by localities	*110.0*	*79.7*	*72.03*	*67.94*
East Central China				
Anhwei				
Laian (1921)	132.4±3.00	125.8±3.76	44.77±2.13	33.81±1.78
Laian (1922)	94.1±3.45	81.5±4.32	51.06±2.44	54.26±3.26
Wuhu	29.0±1.63	19.9±2.04	24.43±1.15	84.24±6.18
Chekiang				
Chinhai	143.1±6.58	118.2±8.25	79.80±4.65	55.77±4.14
Fukien				
Lienkiang	55.4±3.22	43.3±4.04	60.59±2.28	109.37±7.57
Kiangsu				
Kiangning (S)	38.9±1.04	34.0±1.30	21.98±0.74	56.50±2.42
Kiangning (T)	15.9±0.28	14.7±0.35	6.12±0.20	38.49±1.42
Wuchin	32.5±0.56	29.2±0.70	14.49±0.40	44.58±1.45
Average by localities	*67.7*	*38.7*	*37.91*	*59.63*
Average by 17 localities	*90.1*	*79.0*	*55.97*	*64.03*

labor is done by men than animals. The percentage of farms having labor animals is shown in table 10. The average number of animal-work units is 90 (table 12) and the median is 79. This amount of work is done by 1.1 labor animal units per farm and shows that animals are idle a great deal of the time. The larger number of 110 for North China compared with 68 for East Central China is accounted for by work such as drilling and carting being done by animals in North China but by men in East Central China, where planting is done by hand and carrying is by means of a pole over the shoulders. The variability of animal-work units is a little lower than that of

TABLE 13. FARM CAPITAL (OPERATOR'S AND LANDLORD'S) PER FARM AND ITS DISTRIBUTION †

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies*	Farm equipment	Total
North China								
Anhwei								
Hwaiyuan	$759.71	$5.72	$134.00	$47.09	$34.50	$23.67	$27.67	$1032.36
Su	1536.94	12.64	86.95	83.02	39.06	27.42	45.34	1831.37
Chihli								
Pingsiang	654.78	35.51	184.73	21.02	30.48	3.77	10.83	941.12
Yenshan (1922)	402.29	40.30	184.87	34.88	32.51	49.90	17.63	762.38
Yenshan (1923)	1225.99	33.14	171.77	50.99	15.34	42.76	40.94	1580.93
Honan								
Sincheng	1928.53	1.81	168.06	65.48	56.90	8.60	33.86	2263.24
Kaifeng	1721.09	24.82	259.77	93.45	132.52	34.18	52.78	2318.61
Shansi								
Wusiang	550.43	67.43	131.76	28.63	24.23	35.79	13.40	851.67
Wutai	1803.05	0.33	287.49	148.25	1.79	3.79	12.63	2257.33
Average by localities	*1175.87*	*24.63*	*178.82*	*63.65*	*40.82*	*25.54*	*28.34*	*1537.67*
East Central China								
Anhwei								
Laian (1921)	1546.98	8.52	355.13	116.58	25.68	116.97	56.40	2226.26
Laian (1922)	934.05	10.89	271.20	83.97	91.45	106.83	39.87	1538.26
Wuhu	2737.36	...	227.21	54.04	2.81	4.93	88.59	3114.94
Chekiang								
Chinhai	1170.97	31.64	437.76	58.75	0.15	12.92	86.09	1798.28
Fukien								
Lienkiang	1742.35	...	351.32	72.44	55.69	11.84	62.03	2295.67
Kiangsu								
Kiangning (S)	1470.35	58.51	495.91	63.31	5.83	29.96	87.23	2211.10
Kiangning (T)	1336.70	15.71	117.00	30.93	58.14	14.70	38.20	1611.38
Wuchin	837.59	2.19	384.51	65.09	45.95	41.24	66.41	1442.98
Average by localities	*1472.04*	*15.93*	*330.01*	*68.14*	*35.71*	*42.43*	*65.60*	*2029.86*
Average by 17 localities	*1315.24*	*20.54*	*249.97*	*65.76*	*38.41*	*33.49*	*45.88*	*1769.29*

*In a few localities, where amounts are large, unsold fuel has been included.

†All values in their and in other tables are in Chinese currency. One dollar is equivalent to fifty-two cents gold.

man-work units as is shown by the coefficient of variability of 64.03 per cent (table 12).

Comparing the different size-groups of farms, those having animal-work units average 29.5 units in the small size-group and 156 in the large size-group. In North China the difference is 5.9 times greater compared with 4.3 times in East Central China. It is caused by the relatively larger amount of animal-work units in the large size-group for North China where animals are used to a greater extent than in East Central China. This difference in size is quite similar to that for crop mow.

The farm business, then, is a small one when these different measures of size, such as farm area, crop area, crop hectare area, number of livestock, and number of days of work by men and animals are taken into consideration. Further

TABLE 14. OPERATOR'S CAPITAL AND ITS DISTRIBUTION PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Hwaiyuan	$715.56	$5.72	$134.00	$47.09	$34.50	$23.65	$27.67	$988.19
Su	978.21	12.64	77.63	83.02	37.52	27.42	45.34	1261.78
Chihli								
Pingsiang	632.48	35.51	184.73	21.01	30.48	3.77	10.82	918.80
Yenshan (1922)	402.29	40.30	184.87	34.88	32.51	49.90	17.63	762.38
Yenshan (1923)	1215.82	33.14	169.37	50.41	15.34	42.76	40.94	1567.78
Honan								
Sincheng	1523.15	1.81	145.42	62.70	39.12	8.60	33.15	1813.95
Kaifeng	1481.13	24.82	259.77	93.45	132.52	34.18	52.78	2078.65
Shansi								
Wusiang	499.31	67.43	131.76	28.63	24.23	35.79	13.40	800.55
Wutai	356.38	0.33	64.34	35.96	1.79	0.98	5.43	465.21
Average by localities	*867.15*	*24.63*	*150.21*	*50.79*	*38.67*	*25.23*	*27.46*	*1184.14*
East Central China								
Anhwei								
Laian (1921)	749.40	8.52	167.41	116.58	22.22	116.97	56.40	1237.50
Laian (1922)	611.85	10.89	214.70	83.97	73.25	106.83	39.87	1141.36
Wuhu	2022.06	...	227.21	54.04	2.82	4.93	88.59	2399.65
Chekiang								
Chinhai	196.38	31.64	416.87	58.75	0.15	12.92	86.09	802.80
Fukien								
Lienkiang	1053.06	...	351.32	72.44	55.69	11.84	62.03	1606.38
Kiangsu								
Kiangning (S)	1069.73	58.51	495.91	63.32	5.82	29.96	87.23	1810.48
Kiangning (T)	659.59	15.71	113.50	30.72	58.12	14.70	37.88	930.22
Wuchin	654.39	2.19	380.09	65.10	45.95	41.24	65.29	1254.25
Average by localities	*877.06*	*15.93*	*295.33*	*68.12*	*33.00*	*42.42*	*65.42*	*1397.33*
Average by 17 localities	*871.31*	*20.54*	*218.76*	*58.94*	*36.00*	*33.32*	*45.33*	*1284.70*

evidence of this small business is found in chapter eight where it is seen that the production per unit of land or per man is low.

CAPITAL INVESTMENT

The capital investment for the 2866 farms is nearly five million dollars, Chinese currency. Such capital is from two sources, that of the operator whether he be an owner, a part owner, or a tenant operator, and that of the landlord. Farm capital is the operator's capital on owner farms, but is the operator's and the landlord's capital on tenant or part owner farms. The average farm capital per farm for all farms is $1769 (table 13). The average capital investment for the operator is $1285 (table 14); for the owner operator it is $1695 (table 15);

TABLE 15. OWNER OPERATOR'S CAPITAL AND ITS DISTRIBUTION PER FARM*

1841 farms, 16 localities, six provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Hwaiyuan	$750.59	$6.76	$137.97	$46.54	$36.58	$22.91	$27.69	$1029.04
Su	1450.07	21.52	111.37	88.97	55.95	30.96	46.77	1805.62
Chihli								
Pingsiang	674.26	33.75	200.05	21.91	32.96	3.94	11.03	977.90
Yenshan (1922)	402.29	40.30	184.87	34.88	32.51	49.90	17.63	762.38
Yenshan (1923)	1225.38	33.81	171.83	51.03	15.71	42.62	41.27	1581.65
Honan								
Sincheng	1829.15	...	154.91	65.79	30.55	9.01	38.87	2128.28
Kaifeng	1523.88	25.80	247.28	84.04	125.07	31.77	49.69	2087.53
Shansi								
Wusiang	556.11	81.19	141.21	30.22	26.28	37.24	13.80	886.05
Wutai	894.92	0.83	161.56	90.30	4.50	2.45	10.19	1164.75
Average by localities	*1034.07*	*27.11*	*167.89*	*57.08*	*40.01*	*25.65*	*28.55*	*1380.36*
East Central China								
Anhwei								
Laian (1921)	1607.39	17.39	358.04	92.42	45.82	132.17	71.80	2325.03
Laian (1922)	828.56	10.12	290.68	82.75	95.69	111.46	39.40	1458.66
Wuhu	2333.03	...	271.25	47.11	2.45	4.45	80.93	2739.22
Fukien								
Lienkiang	1945.47	...	290.86	60.79	69.32	11.21	46.72	2424.37
Kiangsu								
Kiangning (S)	1491.09	84.97	555.89	65.26	6.73	29.89	90.83	2324.16
Kiangning (T)	1534.03	29.99	177.16	45.31	78.17	17.44	47.62	1929.72
Wuchin	837.74	0.14	432.71	66.26	53.07	42.27	66.45	1498.64
Average by localities	*1511.05*	*20.37*	*339.44*	*65.70*	*50.18*	*49.84*	*63.39*	*2099.97*
Average by 16 localities	*1242.75*	*24.16*	*242.95*	*60.85*	*44.46*	*36.23*	*43.79*	*1695.19*

*Localities with fewer than 20 owner farms have been omitted.

TABLE 16. PART OWNER OPERATOR'S CAPITAL AND ITS DISTRIBUTION PER FARM

446 farms, 10 localities, six provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Su	$619.94	$0.70	$57.46	$60.44	$22.42	$21.60	$35.18	$817.74
Chihli								
Pingsiang	446.89	48.95	112.39	17.71	18.86	3.11	10.47	658.38
Honan								
Sincheng	1077.11	5.91	143.39	54.80	62.78	7.29	19.31	1370.59
Kaifeng	1330.85	21.40	303.64	126.56	158.69	42.65	63.65	2047.44
Shansi								
Wusiang	298.03	7.37	94.83	25.32	17.68	33.17	13.08	489.48
Average by localities	*754.56*	*16.87*	*142.34*	*56.97*	*56.09*	*21.56*	*23.34*	*1076.73*
East Central China								
Anhwei								
Wuhu	2290.91	...	222.27	77.07	4.55	6.42	115.82	2717.04
Fukien								
Lienkiang	439.84	...	428.30	88.19	39.07	13.87	81.01	1090.28
Kiangsu								
Kiangning (S)	438.25	16.70	407.50	61.49	2.00	30.16	84.13	1040.23
Kiangning (T)	910.52	31.09	107.39	39.75	66.46	15.79	41.63	1212.63
Wuchin	363.18	1.00	367.00	54.97	41.80	37.97	62.49	928.41
Average by localities	*888.54*	*9.76*	*306.49*	*64.29*	*30.78*	*20.84*	*77.02*	*1397.72*
Average by 10 localities	*821.55*	*13.31*	*224.42*	*60.63*	*43.43*	*21.20*	*52.68*	*1237.22*

*Localities with fewer than 20 part owner farms have been omitted.

TABLE 17. TENANT OPERATOR'S CAPITAL AND ITS DISTRIBUTION PER FARM*

486 farms, eight localities, five provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Su	...	...	$1.65	$90.68	$0.54	$23.48	$52.40	$168.75
Shansi								
Wutai	...	...	...	...	...	...	2.28	2.28
East Central China								
Anhwei								
Laian (1921)	...	...	...	143.02	...	103.71	42.48	289.21
Laian (1922)	...	$5.24†	...	82.25	10.48	93.54	38.86	230.37
Chekiang								
Chinhai	...	...	336.86	37.69	...	9.57	65.82	449.94
Fukien								
Lienkiang	...	...	314.77	62.56	61.71	7.71	54.34	501.09
Kiangsu								
Kiangning (T)	...	...	76.15	17.60	41.86	12.50	30.12	178.23
Wuchin	...	13.63	126.74	68.66	13.85	39.10	62.05	324.03
Average by eight localities	...	*2.36*	*107.02*	*62.81*	*16.06*	*36.20*	*43.54*	*267.99*

*Localities with fewer than 20 tenant farms have been omitted.

†This is a security deposit (押板) made by the tenant to the landlord.

TABLE 18. AVERAGE CAPITAL AND ITS DISTRIBUTION PER FARM FOR LANDLORDS OF PART OWNER OPERATORS*

446 farms, 10 localities, six provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Su	$467.06	...	$3.18	...	$0.95	...	...	$471.19
Chihli								
Pingsiang	143.93	...	...	...	...	...	...	143.93
Honan								
Sincheng	853.98	...	24.88	...	...	...	...	878.86
Kaifeng	1083.45	...	...	...	...	...	...	1083.45
Shansi								
Wusiang	290.00	...	...	...	...	...	...	290.00
East Central China								
Anhwei								
Wuhu	1513.03	...	...	...	...	...	...	1513.03
Fukien								
Lienkiang	1157.78	...	...	...	...	...	...	1157.78
Kiangsu								
Kiangning (S)	1047.33	...	...	...	...	...	...	1047.33
Kiangning (T)	605.98	...	6.09	...	...	...	...	612.07
Wuchin	466.13	...	...	...	...	...	...	466.13
Average by 10 localities	*762.87*	...	*3.42*	...	*0.09*	...	...	*766.38*

*Localities with fewer than 20 part owner farms have been omitted.

TABLE 19. AVERAGE CAPITAL AND ITS DISTRIBUTION PER FARM FOR LANDLORDS OF TENANT OPERATORS*

486 farms, eight localities, five provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Su	$2287.19	...	$43.28	...	$6.70	...	...	$2337.17
Shansi								
Wutai	2404.01	...	370.85	$186.60	...	$4.67	$11.95	2978.08
East Central China								
Anhwei								
Laian (1921)	1512.45	...	366.28	...	6.86	...	...	1885.59
Laian (1922)	1180.95	...	220.95	...	74.29	...	...	1476.19
Chekiang								
Chinhai	842.26	...	14.70	...	...	...	...	856.96
Fukien								
Lienkiang	1518.36	...	...	...	...	...	...	1518.36
Kiangsu								
Kiangning (T)	1133.89	...	4.57	0.43	0.05	...	0.66	1139.60
Wuchin	844.53	...	30.81	...	...	...	5.47	880.81
Average by eight localities.	*1465.46*	...	*131.43*	*23.38*	*10.99*	*0.58*	*2.26*	*1634.10*

*Localities with fewer than 20 tenant farms have been omitted.

for the part owner operator, $1237 (table 16); and for the tenant operator, $268 (table 17). Tenants have so low an investment because their capital is working capital only.

Farm capital for the North China farms is $1538, or nearly one-fourth lower than that of $2030 for East Central China farms. Differences in quality of land, of buildings, of location in respect to markets, and possibly of price levels, are the chief factors influencing such a condition. The lowest average farm capital for any locality is $762 for Yenshan Hsien (1922), Chihli, and the highest is $3115 for Wuhu Hsien, Anhwei. If

TABLE 20. VALUE PER HECTARE (FARM AREA) OF OPERATOR'S AND LANDLORD'S CAPITAL BY ITEMS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged*	Buildings	Livestock	Trees	Supplies	Farm equipment	Total per hectare†
North China								
Anhwei								
Hwaiyuan	$208.81	$125.19	$36.30	$12.89	$9.39	$6.51	$7.51	$280.30
Su	321.27	293.42	17.97	17.22	8.10	5.70	9.37	375.56
Chihli								
Pingsiang	632.07	331.86	161.60	18.39	26.70	3.36	9.55	823.73
Yenshan (1922)	224.18	221.45	93.51	17.71	16.47	25.27	8.92	385.81
Yenshan (1923)	351.13	177.24	46.69	13.87	4.21	11.64	11.15	429.77
Honan								
Sincheng	629.34	338.97	54.77	21.37	18.50	2.72	11.04	737.31
Kaifeng	529.12	325.98	78.05	28.08	39.80	10.34	15.85	696.59
Honan								
Wusiang	340.14	292.98	71.29	15.52	13.06	19.36	7.22	460.59
Wutai	217.17	241.66	34.64	17.88	0.16	0.48	1.45	271.79
Average by localities	*383.69*	*260.97*	*66.09*	*18.10*	*15.16*	*9.49*	*9.13*	*495.72*
East Central China								
Anhwei								
Laian (1921)	379.49	311.71	86.44	28.45	6.34	28.45	13.77	542.41
Laian (1922)	381.84	103.48	106.74	32.98	36.06	42.04	15.77	605.84
Wuhu	1627.58	...	135.06	32.17	1.63	2.97	52.63	1852.04
Chekiang								
Chinhai	919.25	97.51	335.14	45.00	0.16	9.90	65.91	1376.64
Fukien								
Lienkiang	1725.89	...	348.12	71.68	55.10	11.67	61.41	2273.87
Kiangsu								
Kiangning (S)	714.04	370.64	223.70	28.58	2.68	13.55	39.32	997.45
Kiangning (T)	609.64	477.94	52.48	13.94	26.08	6.73	17.22	724.13
Wuchin	637.49	556.64	292.65	49.54	34.93	31.45	50.51	1098.66
Average by localities	*874.40*	*239.74*	*197.54*	*37.79*	*20.37*	*18.35*	*39.57*	*1183.38*
Average by 17 localities	*614.61*	*250.98*	*127.95*	*27.37*	*17.61*	*13.66*	*23.45*	*819.56*

*Average per hectare mortgaged.

†In calculating this total, the value of land owned and mortgaged was added and divided by the total farm area for the purpose of finding total investment per hectare in land.

11. *The plow and harrow are the chief implements of the Chinese farmer. These are the types used southwest of Tsingchow, Shantung, but in many parts of North China iron rather than wooden beams are used. A harrow with two rows of teeth is quite generally found.*

a comparison is made between amounts of farm capital for the three types of land tenure, the landlord's capital in tables 18 and 19 should be added to the part owner and tenant operator's capital in tables 16 and 17. To make such data comparable only localities having the particular type of tenure should be included in the averages. This shows an average farm capital investment on owner and tenant farms in the same localities of $1801 and $1987; on owner and part owner farms in the same localities of $1880 and $2004, and on part owner and tenant farms $1689 and $1762 respectively. This shows that in all cases but one that tenant farms have a larger amount of capital than do farms belonging either to owners or part owners.

TABLE 21. PERCENTAGE DISTRIBUTION OF CAPITAL FOR BOTH LANDLORDS AND OPERATORS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Land owned	Land mortgaged	Buildings	Livestock	Trees	Supplies	Farm equipment	Total
North China								
Anhwei								
Hwaiyuan	73.6	0.6	13.0	4.6	3.3	2.2	2.7	100
Su	83.9	0.7	4.8	4.5	2.1	1.5	2.5	100
Chihli								
Pingsiang	69.6	3.8	19.6	2.2	3.2	0.4	1.2	100
Yenshan (1922)	52.8	5.3	24.2	4.6	4.3	6.5	2.3	100
Yenshan (1923)	77.5	2.1	10.9	3.2	1.0	2.7	2.6	100
Honan								
Sincheng	85.2	0.1	7.4	2.9	2.5	0.4	1.5	100
Kaifeng	74.2	1.1	11.2	4.0	5.7	1.5	2.3	100
Shansi								
Wusiang	64.6	7.9	15.5	3.4	2.8	4.2	1.6	100
Wutai	79.8	...	12.7	6.6	0.1	0.2	0.6	100
*Average**	*76.5*	*1.6*	*11.6*	*4.1*	*2.7*	*1.7*	*1.8*	*100*
East Central China								
Anhwei								
Laian (1921)	69.5	0.4	16.0	5.2	1.1	5.3	2.5	100
Laian (1922)	60.7	0.7	17.6	5.5	6.0	6.9	2.6	100
Wuhu	87.9	...	7.3	1.7	0.1	0.2	2.8	100
Chekiang								
Chinhai	65.0	1.8	24.4	3.3	...	0.7	4.8	100
Fukien								
Lienkiang	75.9	...	15.3	3.2	2.4	0.5	2.7	100
Kiangsu								
Kiangning (S)	66.5	2.7	22.4	2.9	0.3	1.3	3.9	100
Kiangning (T)	82.9	1.0	7.3	1.9	3.6	0.9	2.4	100
Wuchin	58.0	0.2	26.6	4.5	3.2	2.9	4.6	100
*Average**	*72.5*	*0.8*	*16.2*	*3.4*	*1.8*	*2.1*	*3.2*	*100*
Average, 17 localities*	*74.3*	*1.2*	*14.1*	*3.7*	*2.2*	*1.9*	*2.6*	*100*

*These averages are computed from the average values per farm by localities.

The amount of the landlord's capital per farm for tenant farms is chiefly confined to investment in land and buildings, which constitute 98 per cent of his total (table 19). A few landlords have investment in livestock and trees.

On a per hectare basis, investment of capital for all items averages $820 (table 20). The highest average investment of $2274 per hectare is for Lienkiang Hsien, Fukien, where land is very fertile; the lowest is $272 for Wutai Hsien, Shansi.

TABLE 22. RELATION OF SIZE OF FARM TO FARM CAPITAL

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Farm capital for farms grouped by size of farm						Ratios of farm capital for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$300.38	$616.22	$1088.09	$1379.07	$2563.95	$1032.36	100	205	362	459	854
Su	468.44	...	1491.51	...	3691.75	1831.37	100	...	318	...	788
Chihli											
Pingsiang	398.56	...	724.09	...	1624.32	941.12	100	...	182	...	408
Yenshan (1922)	294.66	508.61	...	812.66	1502.56	762.38	100	173	...	276	510
Yenshan (1923)	414.04	...	1257.98	...	3140.07	1580.93	100	...	304	...	758
Honan											
Sincheng	986.48	1715.33	...	2906.39	5354.47	2263.24	100	174	...	295	543
Kaifeng	723.81	1451.31	...	2436.02	4484.38	2318.61	100	201	...	337	620
Shansi											
Wusiang	232.06	422.81	707.81	1025.08	2038.09	851.67	100	182	305	442	878
Wutai	1002.49	1556.48	2686.84	2892.91	3799.43	2257.33	100	155	268	289	379
Average by localities	*535.66*	...	*1324.64**	...	*3133.23*	*1537.67*	*100*	...	*247*	...	*585*
East Central China											
Anhwei											
Laian (1921)	1104.17	1857.54	...	2372.35	3393.08	2226.26	100	168	...	215	307
Laian (1922)	683.50	...	1533.83	...	2427.28	1538.26	100	...	224	...	355
Wuhu	1045.14	1977.95	...	3477.53	7154.93	3114.94	100	189	...	333	685
Chekiang											
Chinhai	970.67	...	1396.90	...	3144.33	1798.28	100	...	144	...	324
Fukien											
Lienkiang	763.70	...	1805.64	...	4550.53	2295.67	100	...	236	...	596
Kiangsu											
Kiangning (S)	974.04	1516.38	...	2171.08	3787.52	2211.10	100	156	...	223	389
Kiangning (T)	752.66	1134.18	1423.60	1953.08	2704.95	1611.38	100	151	189	259	359
Wuchin	544.71	1205.01	1900.09	2645.60	3329.14	1442.98	100	221	349	486	611
Average by localities	*854.82*	...	*1773.27**	...	*3811.47*	*2029.86*	*100*	...	*207*	...	*446*
Average by 17 localities	*685.85*	...	*1535.76**	...	*3452.40*	*1769.29*	*100*	...	*224*	...	*503*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

The amount of farm capital is so small that a net return of 10 per cent on such investment would give profits of only $177 per farm.

Distribution of Capital

The distribution of capital among different items shows that three-fourths is invested in land and 92 per cent in real estate (land, trees, and buildings) (fig. 6, table 21). Buildings are next to land in importance and constitute 14.1 per cent of total capital. Investment in livestock, farm equipment, and

TABLE 23. FARM RECEIPTS (OPERATOR'S AND LANDLORD'S) AND THEIR DISTRIBUTION PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Cash receipts							Non-cash receipts		Total receipts per farm
	Grain crops	Fiber crops	Vegetables, tuber crops, and other crops	Fruits	Silkworm enterprise	Livestock and products	Miscellaneous	Products from the farm used by the family	Increase of capital	
North China										
Anhwei										
Hwaiyuan	$45.78	$3.15	$1.10	$0.60	$0.38	$10.96	$5.75	$118.01	$7.77	$193.50
Su	105.72	4.39	13.93	0.93	0.28	15.40	15.63	151.20	5.84	313.32
Chihli										
Pingsiang	35.69	19.20	5.75	...	...	2.35	12.72	61.03	2.29	139.03
Yenshan (1922)	79.02	...	0.34	2.14	...	4.06	2.12	70.15	9.97	167.80
Yenshan (1923)	24.36	0.10	0.29	...	...	4.48	12.56	93.13	3.07	137.99
Honan										
Sincheng	80.02	...	11.65	8.61	1.20	10.00	37.06	191.97	23.87	364.38
Kaifeng	114.30	0.40	18.12	3.22	...	12.42	14.13	291.21	6.37	460.17
Shansi										
Wusiang	61.42	3.67	1.95	1.94	...	8.88	1.42	76.50	3.35	159.13
Wutai	297.35	0.91	13.65	...	...	6.92	0.13	238.62	11.60	569.18
Average by localities	*93.74*	*3.53*	*7.42*	*1.94*	*0.21*	*8.38*	*11.28*	*143.54*	*8.24*	*278.28*
East Central China										
Anhwei										
Laian (1921)	388.43	7.30	0.16	0.14	9.79	45.22	25.86	251.68	10.58	739.16
Laian (1922)	167.30	0.81	7.40	...	13.01	19.46	25.70	151.60	5.01	390.29
Wuhu	238.98	...	...	...	...	16.67	7.64	193.48	4.01	460.78
Chekiang										
Chinhai	177.49	50.38	43.61	5.43	...	27.10	47.56	53.20	12.20	416.97
Fukien										
Lienkiang	253.96	3.52	69.60	...	...	34.62	53.29	183.03	17.88	615.90
Kiangsu										
Kiangning (S)	338.09	...	26.49	0.12	...	35.12	14.99	131.89	0.77	547.47
Kiangning (T)	97.07	0.15	0.64	2.86	41.95	19.05	71.93	99.99	1.61	335.25
Wuchin	95.50	...	1.43	3.12	53.14	30.50	4.62	194.04	3.43	385.78
Average by localities	*219.60*	*7.77*	*18.67*	*1.46*	*14.73*	*28.47*	*31.45*	*157.36*	*6.94*	*486.45*
Average by 17 localities	*152.97*	*5.53*	*12.71*	*1.71*	*7.04*	*17.84*	*20.77*	*150.05*	*7.62*	*376.24*

*These "other crops" in tables 23—28, and 30 were classified in this column rather than under "miscellaneous crops," through some oversight in the routine work. However, the values do not appreciably change the results except for Wusiang, Shansi where other crops have a value of $1.07.

supplies is very small compared with the other items and with similar items in western countries. Absence of a livestock

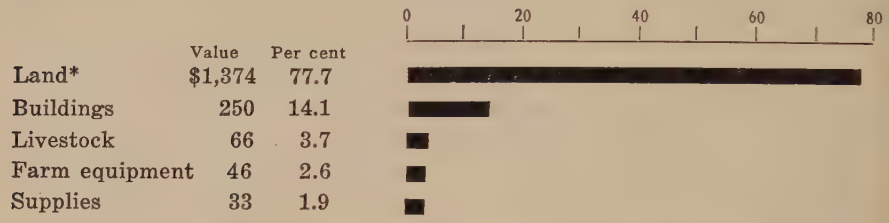

Fig. 6.—Value and percentage distribution of farm capital per farm. 2866 farms, 17 localities, seven provinces, China (1921-1925).

*The value of trees is included.

TABLE 24. OPERATOR'S RECEIPTS AND THEIR DISTRIBUTION PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Cash receipts							Non-cash receipts		Total receipts per farm
	Grain crops	Fiber crops	Vegetables, tuber crops, and other crops	Fruits	Silkworm enterprise	Livestock and products	Miscellaneous	Products from the farm used by the family	Increase of capital	
North China										
Anhwei										
Hwaiyuan	$42.91	$3.15	$1.10	$0.60	$0.38	$10.96	$5.06	$118.01	$7.77	$189.94
Su	62.00	2.87	9.57	0.89	0.28	15.41	11.04	151.13	5.79	258.99
Chihli										
Pingsiang	34.73	19.19	5.75	...	...	2.35	12.35	61.03	2.29	137.69
Yenshan (1922)	79.02	...	0.34	2.14	...	4.06	2.12	70.15	9.97	167.80
Yenshan (1923)	24.01	0.10	0.29	...	...	4.48	12.56	93.13	2.95	137.52
Honan										
Sincheng	52.14	...	7.33	8.07	1.20	9.99	37.06	191.97	22.41	330.19
Kaifeng	94.17	0.40	17.92	3.22	...	12.42	14.13	291.21	6.37	439.84
Shansi										
Wusiang	58.20	3.67	1.95	1.78	...	8.88	1.42	76.46	3.35	155.71
Wutai	126.40	0.82	3.19	...	...	2.15	0.13	108.97	0.84	242.50
Average by localities	*63.73*	*3.35*	*5.27*	*1.86*	*0.21*	*7.86*	*10.66*	*129.12*	*6.85*	*223.91*
East Central China										
Anhwei										
Laian (1921)	221.78	5.22	0.15	0.10	9.79	45.22	24.08	251.68	10.58	568.60
Laian (1922)	133.63	0.52	7.40	...	13.01	19.46	25.70	151.60	5.01	356.33
Wuhu	218.79	...	...	...	...	16.67	7.64	193.40	4.01	440.51
Chekiang										
Chinhai	114.35	50.38	43.88	4.47	...	27.09	34.34	53.20	3.24	330.95
Fukien										
Lienkiang	202.60	3.53	67.39	...	...	34.62	53.29	151.37	17.88	530.68
Kiangsu										
Kiangning (S)	310.06	...	26.49	0.12	...	35.12	14.99	128.23	0.77	515.78
Kiangning (T)	69.75	0.15	0.64	2.86	41.95	19.05	63.11	99.99	1.56	299.06
Wuchin	74.51	...	1.43	3.12	53.14	30.50	4.42	194.04	3.43	364.59
Average by localities	*168.18*	*7.47*	*18.42*	*1.83*	*14.74*	*28.47*	*28.45*	*152.94*	*5.81*	*425.81*
Average by 17 localities	*112.89*	*5.29*	*11.46*	*1.61*	*7.04*	*17.55*	*19.03*	*140.33*	*6.37*	*321.57*

industry and farm machinery accounts to a large extent for this condition. Compared with some other countries, the investment in land is greater because of high prices due to dense population and because of small investment in livestock or farm equipment. Mortgaged land makes up only 1.2 per cent of the total capital. Trees in China are usually bought and sold separate from land, although they have been included with land in figs. 6 and 7 for comparative purposes. They amount to $38 per farm, or 2.2 per cent of the total capital investment.

The item of mortgaged land is the equivalent of additional land rented from others. It is obtained by loaning the owner

TABLE 25. OWNER OPERATOR'S RECEIPTS AND THEIR DISTRIBUTION PER FARM*

1841 farms, 16 localities, six provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH RECEIPTS							NON-CASH RECEIPTS		Total receipts per farm
	Grain crops	Fiber crops	Vegetables, tuber crops, and other crops	Fruits	Silkworm enterprise	Livestock and products	Miscellaneous	Products from the farm used by the family	Increase of capital	
North China										
Anhwei										
Hwaiyuan	$41.81	$3.50	$1.19	$0.15	$0.36	$10.99	$5.63	$119.83	$6.82	$190.28
Su	82.48	3.53	13.23	0.93	0.38	15.01	13.53	174.72	7.00	310.81
Chihli										
Pingsiang	35.96	20.55	4.74	...	...	2.41	12.49	62.66	2.40	141.21
Yenshan (1922)	79.02	...	0.34	2.14	...	4.06	2.12	70.15	9.97	167.80
Yenshan (1923)	23.83	0.10	0.30	...	...	4.60	12.71	93.31	3.04	137.89
Honan										
Sincheng	59.69	...	5.07	8.59	1.65	10.33	26.65	198.26	23.23	333.47
Kaifeng	89.06	0.17	14.46	3.10	...	12.58	11.71	262.26	5.24	398.58
Shansi										
Wusiang	61.91	3.79	1.91	1.40	0.01	9.33	1.28	78.96	3.58	162.16
Wutai	97.48	1.92	6.19	...	...	5.40	0.33	159.05	2.10	272.47
Average by localities	*63.47*	*3.73*	*5.27*	*1.81*	*0.27*	*8.30*	*9.60*	*135.47*	*7.04*	*234.96*
East Central China										
Anhwei										
Laian (1921)	237.30	10.13	0.10	0.09	9.52	22.52	16.66	263.88	17.77	577.97
Laian (1922)	141.99	0.58	10.14	...	12.84	19.76	22.34	153.73	4.78	366.16
Wuhu	171.95	...	...	...	...	10.81	7.32	171.84	4.21	366.13
Fukien										
Lienkiang	231.15	0.47	112.26	...	...	22.33	51.36	176.06	12.63	606.26
Kiangsu										
Kiangning (S)	353.78	...	41.98	0.20	...	35.03	11.98	133.28	0.63	576.88
Kiangning (T)	82.18	0.30	0.11	1.82	61.50	17.45	61.27	130.11	1.54	356.28
Wuchin	75.64	...	1.22	1.01	61.35	29.31	3.31	208.26	2.92	383.02
Average by localities	*184.86*	*1.64*	*23.69*	*0.44*	*20.74*	*22.46*	*24.89*	*176.74*	*6.35*	*461.81*
Average by 16 localities	*116.53*	*2.32*	*13.33*	*1.21*	*9.23*	*14.49*	*16.29*	*153.52*	*6.74*	*334.21*

*Chinhai Hsien, Chekiang, has been omitted because it has only one owner farm.

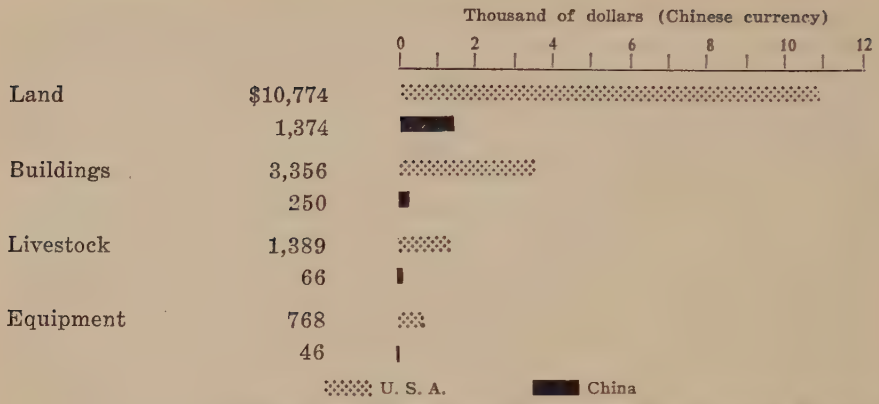

Fig. 7.—A comparison of farm capital investment for United States* and China.†

*These data are for the whole country and are taken from the Statistical Abstract of the United States, Dept. of Commerce, Washington, 1928.

†The data are from 2866 farms, 17 localities, seven provinces, China (1921-1925). The value of trees have been included with the item for land.

a sum of money equal to about one-half the value of the land. The mortgagee has the use of the land as interest until the debt is repaid. The mortgage value is commonly about one-half the actual market value. The legal time for refunding, in many places, is three years, but the debts are often not paid at this time and the mortgagee continues to use the land.

Average investment per hectare for the different capital items is land, $615; buildings, $128; livestock, $27; farm equipment, $23; trees, $18; and seeds and supplies, $14 (table 20). These items compared with those of the United States are shown in fig. 7.

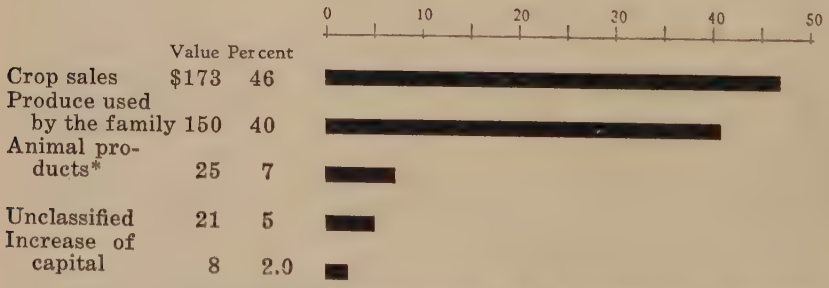

Fig. 8.—Value (Chinese currency) and percentage distribution of all farm receipts per farm.

2866 farms, 17 localities, seven provinces, China (1921-1925).

*Including receipts from the silkworm enterprise.

The range of average values per hectare for the different capital items shows in each case lowest values for North China and highest for East Central China localities. Land is over twice, buildings three times, and farm equipment four times as valuable per hectare in East Central China as in the North China localities. Buildings made of brick and tile and greater productivity of land account for part, if not all, of these higher land and building values.

As to equipment, carts in North China, as an expensive item, offset pumps for irrigation in East Central China. East Central China farmers, because of larger profits, as shown later, may invest in more and better equipment. The exact difference in the equipment requirements for the two regions did not

TABLE 26. PART OWNER OPERATOR'S RECEIPTS AND THEIR DISTRIBUTION PER FARM*

446 farms, 10 localities, six provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH RECEIPTS							NON-CASH RECEIPTS		Total receipts per farm
	Grain crops	Fiber crops	Vegetables, tuber crops, and other crops	Fruits	Silkworm enterprise	Livestock and products	Miscellaneous	Products from the farm used by the family	Increase of capital	
North China										
Anhwei										
Su	$33.78	$2.12	$6.01	$1.43	...	$11.12	$5.84	$115.98	$4.30	$180.58
Chihli										
Pingsiang	30.72	13.04	12.11	...	...	2.18	11.68	56.52	1.88	128.13
Honan										
Sincheng	36.48	...	6.55	7.45	...	8.63	44.92	179.87	21.01	304.91
Kaifeng	112.15	1.21	30.06	3.64	...	11.91	22.62	392.95	10.32	584.86
Shansi										
Wusiang	47.23	3.75	2.55	5.28	...	8.14	0.98	72.67	2.77	143.37
Average by localities	*52.07*	*4.02*	*11.46*	*3.56*	...	*8.40*	*17.21*	*163.60*	*8.05*	*263.37*
East Central China										
Anhwei										
Wuhu	353.83	...	...	...	...	30.35	11.18	256.87	3.95	656.18
Fukien										
Lienkiang	202.47	6.76	27.31	...	...	49.15	56.02	136.20	23.98	501.89
Kiangsu										
Kiangning (S)	238.27	...	...	...	...	36.08	18.13	122.47	0.73	415.68
Kiangning (T)	87.99	0.26	0.26	2.48	$38.01	20.68	77.59	105.45	2.31	335.03
Wuchin	71.19	...	...	3.50	43.52	34.41	10.91	153.42	2.57	319.52
Average by localities	*190.75*	*1.40*	*5.51*	*1.20*	*16.31*	*34.13*	*34.77*	*154.38*	*6.71*	*445.66*
Average by 10 localities	*121.41*	*2.71*	*8.49*	*2.38*	*8.15*	*21.27*	*25.99*	*159.24*	*7.38*	*357.02*

*Localities with fewer than 20 part owner farms have been omitted.

constitute a part of this study and therefore further explanation of the large difference cannot be made.

A few exceptional conditions in values per hectare must be explained. Land values for the year 1922 at Yenshan Hsien, Chihli, were abnormally low because of a previous bad crop year. A good crop in 1922 caused values to return to normal and this accounts for the higher values for the study made in nearby villages in 1923. The effect of the bad crop year of 1923 is not apparent because values at the beginning of the year were the ones taken.

The very high land values at Lienkiang Hsien, Fukien, are caused by unusually fertile land and those at Wuhu Hsien, Anhwei, by fertile land and the social prestige value to the landlord.

That farm capital is a fair measure of size of farm is shown by the fact that such relationship is practically the same as that between size of farm and crop hectare area. The farms in the small size-group have farm capital amounting to

TABLE 27. RECEIPTS AND THEIR DISTRIBUTION PER FARM FOR TENANT OPERATORS*

486 farms, eight localities, five provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Cash receipts							Non-cash receipts		Total receipts per farm
	Grain crops	Fiber crops	Vegetables, tuber crops, and other crops	Fruits	Silkworm enterprise	Livestock and products	Miscellaneous	Products from the farm used by the family	Increase of capital	
North China										
Anhwei										
Su	$33.58	$1.77	$2.86	$0.18	$0.30	$21.31	$9.52	$121.28	$3.93	$194.73
Shansi										
Wutai	145.53	0.10	1.21	...	...	...	...	75.83	...	222.67
East Central China										
Anhwei										
Laian (1921) ..	209.63	0.23	0.22	...	10.79	67.15	32.06	246.54	4.78	571.40
Laian (1922) ..	103.81	0.48	...	...	11.24	18.07	34.76	142.15	7.21	317.72
Chekiang										
Chinhai	65.59	65.01	35.50	5.79	...	18.91	31.06	36.66	2.10	260.62
Fukien										
Lienkiang	109.51	3.68	42.65	...	...	30.61	51.30	116.75	16.48	370.98
Kiangsu										
Kiangning (T) ..	53.96	...	1.14	3.69	31.38	19.33	57.93	78.66	1.24	247.33
Wuchin	71.88	...	3.86	13.37	20.61	32.88	4.00	160.09	6.79	313.48
Average by eight localities	*99.19*	*8.91*	*10.93*	*2.88*	*9.29*	*26.03*	*27.53*	*122.24*	*5.32*	*312.37*

*Localities with fewer than 20 tenant farms have been omitted.

12. *This is the type of stone packer used after grain has been sown with a three-rowed drill in the dry soils of the Taiyuan plain, Shansi.*

$686 compared with $3,452 per farm in the large size-group (table 22). Seven localities have capital six to nine times greater in the large size-group and ten localities three to six times greater. In North China the difference is 5.8 times greater compared with only 4.5 times greater in East Central China. This difference in relationship is caused by relatively lower capital per farm in North China in the small size-group.

RECEIPTS, AMOUNT AND DISTRIBUTION

The average farm receipts amount to $376 per farm for all localities, but only $278 for North China farms compared with $486 for those of East Central China (table 23). The differences between North and East Central China may be due

TABLE 28. RECEIPTS AND THEIR DISTRIBUTION PER FARM FOR LANDLORDS OF PART OWNER OPERATORS*

446 farms, 10 localities, six provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Cash receipts							Non-cash receipts		Total receipts per farm
	Grain crops	Fiber crops	Vegetables, tuber crops, and other crops	Fruits	Silkworm enterprise	Livestock and products	Miscellaneous	Products from the farm used by the family	Increase of capital	
North China										
Anhwei										
Su	$42.87	$1.40	$1.87	...	...	...	$2.98	$0.32	...	$49.44
Chihli										
Pingsiang	6.09	...	...	...	...	...	2.57	...	...	8.66
Honan										
Sincheng	56.24	...	1.75	$1.02	...	...	...	...	...	59.01
Kaifeng	90.87	...	0.91	...	...	...	...	...	...	91.78
Shansi										
Wusiang	19.13	...	...	...	...	...	...	0.26	...	19.39
Average by localities	*43.04*	*0.23*	*0.91*	*0.20*	...	...	*1.11*	*0.12*	...	*45.66*
East Central China										
Anhwei										
Wuhu	45.09	...	...	...	...	...	...	0.24	...	45.33
Fukien										
Lienkiang	88.42	...	...	...	...	...	...	56.42	...	144.84
Kiangsu										
Kiangning (S)	74.19	...	...	...	...	...	...	9.05	...	83.24
Kiangning (T)	22.64	...	...	...	...	...	9.66	...	...	32.30
Wuchin	55.06	...	...	...	...	...	...	...	...	55.06
Average by localities	*57.08*	...	...	...	...	...	*1.93*	*13.14*	...	*72.15*
Average by 10 localities	*50.06*	*0.14*	*0.45*	*0.10*	...	...	*1.52*	*6.63*	...	*58.91*

*Localities with fewer than 20 part owner farms have been omitted.

to quantity of produce per farm, to type of produce, or to difference in price levels. Receipts for all owner operators are shown in table 25, for part owner operators in table 26, for tenant operators in table 27, for landlords of part owner operators in table 28, and for landlords of tenant operators in table 29.

A summary of operator's (both tenant and owner) cash receipts shows little difference between North and East Central China in the proportions for different groups of products except for a larger percentage for silkworms in the latter (table 24).

Tenancy has some effect on proportion of receipts at Su Hsien, Anhwei, where sweet potatoes constitute four per cent of the owner's receipts and one per cent of the tenant's receipts, and this may be accounted for by the fact that the landlords refuse to accept sweet potatoes as share rent. The same type of difference is found at Lienkiang Hsien, Fukien, where sweet potatoes constitute nearly one-fifth of the cash receipts for owners and only a little over one-tenth for tenants.

TABLE 29. RECEIPTS AND THEIR DISTRIBUTION PER FARM FOR LANDLORDS OF TENANT OPERATORS*

486 farms, eight localities, five provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Cash receipts							Non-cash receipts		
	Grain crops	Fiber crops	Vegetables, tuber crops	Fruits	Silk worm enterprise	Livestock and its products	Miscellaneous	Products from the farm used by the family	Increase of capital	Total receipts per farm
North China										
Anhwei										
Su	$172.01	$6.06	$19.71	$0.18	...	...	$19.77	...	$0.23	$217.96
Shansi										
Wutai	284.09	0.14	17.37	...	...	$7.92	...	$215.46	17.88	542.86
East Central China										
Anhwei										
Laian (1921)	325.83	4.11	0.02	...	...	...	...	...	...	329.96
Laian (1922)	117.22	1.14	...	...	...	...	...	...	...	118.36
Chekiang										
Chinhai	54.22	...	...	...	...	...	12.52	...	11.76	78.50
Fukien										
Lienkiang	106.59	...	16.14	...	...	...	...	59.87	...	182.60
Kiangsu										
Kiangning (T)	46.55	...	...	...	...	...	14.01	...	0.10	60.66
Wuchin	95.24	...	...	...	...	...	1.40	...	...	96.64
Average by eight localities	*150.22*	*1.43*	*6.65*	*0.02*	...	*0.99*	*5.96*	*34.42*	*3.75*	*203.44*

*Localities with fewer than 20 tenant farms have been omitted.

Distribution of receipts for all farms shows that over two fifths of the receipts are from grain crops and two-fifths are from produce supplied the family by the farm, most of which is also grains of some kind (table 23). Livestock products constitute only 4.7 per cent and vegetable and tuber crops only 3.4 per cent of the total receipts. The distribution of receipts is graphically shown in fig. 8. In no locality do livestock products reach ten per cent of the total receipts. This is an important difference from agricultural practice in parts of the United States, where in many localities greatest profits occur when at least one-third of the receipts are from livestock products. Products from both animals and crops insure diversity

TABLE 30. PERCENTAGE DISTRIBUTION OF FARM CASH RECEIPTS (FOR OPERATORS AND LANDLORDS)

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Cash receipts							
	Grain crops	Fiber crops	Vegetables tuber crops & other crops	Fruits	Silk worm enterprise	Livestock and its products	Miscellaneous	Total
North China								
Anhwei								
Hwaiyuan	67.6	4.6	1.6	0.9	0.6	16.2	8.5	100.0
Su	67.6	2.8	8.9	0.6	0.2	9.9	10.0	100.0
Chihli								
Pingsiang	47.1	25.4	7.6	...	...	8.1	16.8	100.0
Yenshan (1922)	90.1	...	0.4	2.5	...	4.6	2.4	100.0
Yenshan (1923)	58.3	0.2	0.7	...	...	10.7	30.1	100.0
Honan								
Sincheng	53.9	...	7.8	5.8	0.8	6.7	25.0	100.0
Kaifeng	70.3	0.3	11.1	2.0	...	7.6	8.7	100.0
Shansi								
Wusiang	77.5	4.6	2.5	2.4	...	11.2	1.8	100.0
Wutai	93.2	0.3	4.5	...	...	2.2	...	100.0
Percentage	*74.1*	*2.8*	*5.9*	*1.5*	*0.2*	*6.6*	*8.9*	*100.0*
East Central China								
Anhwei								
Laian (1921)	81.4	1.5	0.1	...	2.1	9.5	5.4	100.0
Laian (1922)	71.6	0.4	3.1	...	5.6	8.3	11.0	100.0
Wuhu	90.8	...	...	...	...	6.3	2.9	100.0
Chekiang								
Chinhai	50.5	14.3	12.4	1.6	...	7.7	13.5	100.0
Fukien								
Lienkiang	61.2	0.9	16.8	...	...	8.3	12.8	100.0
Kiangsu								
Kiangning (S)	81.5	...	6.4	...	...	8.5	3.6	100.0
Kiangning (T)	41.5	0.1	0.3	1.2	18.0	8.1	30.8	100.0
Wuchin	50.7	...	0.8	1.7	28.2	16.2	2.4	100.0
Percentage	*68.2*	*2.4*	*5.8*	*0.4*	*4.6*	*8.8*	*9.8*	*100.0*
Percentage	*70.0*	*2.5*	*5.9*	*0.8*	*3.2*	*8.1*	*9.5*	*100.0*

and lessen risk. What few animals the farmers have in the famine regions of China afford a reserve which may be disposed of if necessity demands.

Mulberry leaves and cocoons constitute 28 per cent of the cash receipts at Wuchin Hsien, Kiangsu, compared with 18 per cent at Kiangning Hsien (T), Kiangsu, for silk and mulberry leaves. None of the other localities produced a significant amount of receipts from the silkworm enterprise. The highest percentage for fruit is 5.8 per cent for Sincheng Hsien, Honan.

Hemp, the only fiber crop at Pingsiang Hsien, Chihli, constitutes one-fourth of all cash receipts. Cotton, the only fiber crop at Chinhai Hsien, Chekiang, gives receipts of approximately one-seventh of the total.

The amount of gross receipts, which is small, may be attributed partly to the lack of diversity. Small receipts denote a small size of farm business regardless of how low the expenses may be.

EXPENSES, AMOUNT AND DISTRIBUTION

In this study family labor and the decrease of capital are the only non-cash items which have been included as expenses. Feed produced and fed on the farm is not entered as an expenditure because it appears in other forms chiefly as a labor and a fertilizer cost in growing it. Feed as a receipt is taken care of by livestock products sold or by crop products produced

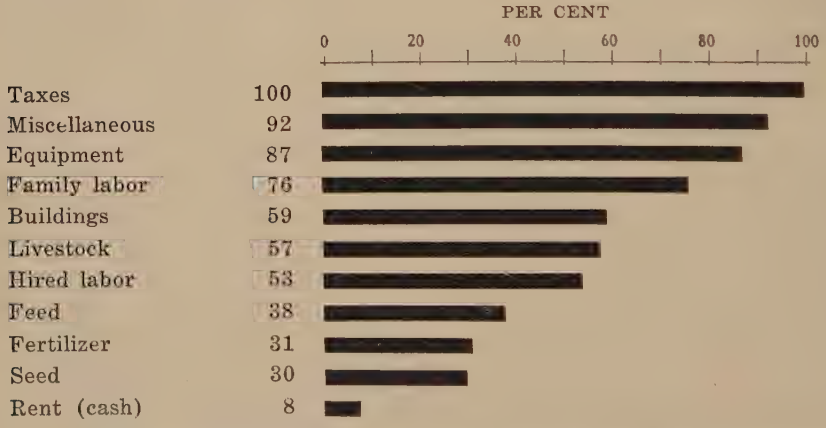

Fig. 9.—Proportion of farms having the specified farm expenditures 2866 farms, 17 localities, seven provinces, China (1921-1925).

with the labor of animals which have eaten it. The operator's labor has not been included as an expense because the method of calculating profits has as its purpose the determination of what the farmer is earning in return for his labor and his management.

Farm expenses of the operator and landlord for all localities average $137 per farm, while for East Central China farms they are 2.4 times greater than for North China farms (table 31). Operators' farm expenses average $131 per farm (table 32), which amount is the same as owner operators' farm expenses (table 33). Part owners' farm expenses average $126 (table 34) as compared with $163 for tenant operators

TABLE 31. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR OPERATORS AND LANDLORDS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH EXPENSES										NON-CASH EXPENSES		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
North China													
Anhwei	$	$	$	$	$	$	$	$	$	$	$	$	$
Hwaiyuan	23.92	2.90	1.58	1.22	8.22	2.06	3.42	3.93	0.54	2.74	58.49	5.01	114.03
Su	17.68	4.22	2.47	3.42	3.50	9.05	5.96	3.39	0.08	6.82	30.44	9.45	96.49
Chihli													
Pingsiang	7.11	2.60	1.44	3.97	0.78	...	2.63	...	0.37	2.00	15.39	0.51	36.80
Yenshan (1922)	3.11	8.60	3.06	10.09	6.71	2.92	2.17	3.35	...	6.51	19.14	1.47	67.13
Yenshan (1923)	13.04	1.33	3.72	0.18	5.51	3.64	4.49	0.50	...	1.56	34.66	7.05	75.68
Honan													
Sincheng	6.63	4.92	2.11	0.58	1.19	0.13	4.17	0.97	...	3.70	70.57	0.38	95.35
Kaifeng	30.03	3.33	2.74	5.84	0.09	...	4.35	4.32	...	1.74	44.24	2.97	99.65
Shansi													
Wusiang	19.44	3.68	1.52	0.07	0.02	0.10	3.91	2.68	0.08	3.05	3.36	2.73	40.64
Wutai	36.98	0.41	4.21	1.51	0.36	3.72	4.94	1.19	...	2.41	51.53	3.81	111.07
Average by localities	*17.55*	*3.55*	*2.54*	*2.99*	*2.93*	*2.40*	*4.01*	*2.26*	*0.12*	*3.39*	*36.42*	*3.71*	*81.87*
East Central China													
Anhwei													
Laian (1921)	53.85	7.01	3.73	9.44	28.79	16.15	5.65	7.28	1.79	6.59	212.08	17.21	369.57
Laian (1922)	21.71	5.67	1.99	3.33	20.40	8.64	3.56	10.13	...	9.99	158.93	12.27	256.62
Wuhu	33.57	17.11	7.11	0.66	1.18	0.23	6.67	4.95	...	5.29	111.86	6.36	194.99
Chekiang													
Chinhai	50.54	8.65	4.77	13.06	6.06	5.53	5.11	3.66	13.23	5.83	18.34	1.19	135.97
Fukien													
Lienkiang	9.19	6.38	5.66	4.44	2.33	2.55	5.89	3.17	...	5.10	94.19	6.67	145.57
Kiangsu													
Kiangning (S)	44.06	2.03	7.07	...	...	...	9.33	8.18	...	3.84	32.14	10.85	117.50
Kiangning (T)	21.24	4.30	3.85	4.47	1.54	0.19	5.00	4.62	8.83	10.37	116.31	6.53	187.25
Wuchin	30.67	9.32	6.27	16.77	26.09	0.13	12.45	9.88	0.20	14.65	20.17	32.00	178.60
Average by localities	*33.11*	*7.56*	*5.05*	*6.52*	*10.80*	*4.18*	*6.71*	*6.48*	*3.01*	*7.71*	*95.50*	*11.64*	*198.23*
Average by 17 localities	*24.87*	*5.44*	*3.72*	*4.65*	*6.63*	*3.24*	*5.28*	*4.25*	*1.48*	*5.42*	*64.22*	*7.44*	*136.64*

(table 35). The outstanding expenses of the landlords of part owner and tenant farms are seed, taxes, and fertilizers (tables 36 and 37).

Expenses per crop hectare average $46 for all farms but are four times as great for the East Central as for the North China farms (table 38). Family labor, which averages $21 per crop hectare for all farms, has a total value on East Central China farms of 4.4 times as much as on North China farms. This is caused partly by a larger amount of labor performed per hectare because of the longer growing season and the more intensive crop, rice.

TABLE 32. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR ALL OPERATORS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH EXPENSES										NON-CASH EXPENSES		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent*	Unclassified	Family labor	Decrease of capital	
North China	$	$	$	$	$	$	$	$	$	$	$	$	$
Anhwei													
Hwaiyuan	23.92	2.88	1.58	1.22	8.22	2.02	3.25	3.93	0.54	2.73	58.49	5.01	113.79
Su	17.68	4.20	2.47	3.28	3.50	0.49	3.63	3.39	0.08	6.08	30.44	9.45	84.69
Chihli													
Pingsiang	7.11	2.60	1.44	3.97	0.78	...	2.63	...	0.37	2.00	15.39	0.51	36.80
Yenshan (1922)	3.11	8.60	3.06	10.09	6.71	2.92	2.17	3.35	...	6.51	19.14	1.47	67.13
Yenshan (1923)	13.04	1.33	3.72	0.18	5.51	3.64	4.43	0.50	...	1.52	34.66	7.05	75.58
Honan													
Sincheng	6.63	4.75	2.02	0.58	1.19	0.13	3.29	0.97	...	3.70	70.57	0.21	94.04
Kaifeng	30.03	3.33	2.74	5.84	0.09	...	3.70	4.32	...	1.74	44.24	2.97	99.00
Shansi													
Wusiang	19.44	3.68	1.52	0.07	0.02	0.10	3.64	2.68	0.08	3.05	3.36	2.73	40.37
Wutai	36.98	0.41	1.79	0.20	0.27	0.96	0.84	0.31	...	1.48	51.53	2.06	96.83
Average by localities	*17.55*	*3.53*	*2.23*	*2.83*	*2.92*	*1.14*	*3.06*	*2.16*	*0.12*	*3.20*	*36.42*	*3.50*	*78.69*
East Central China													
Anhwei													
Laian (1921)	53.85	5.53	3.73	1.05	28.79	0.01	2.45	7.28	1.79	3.82	212.08	17.21	337.59
Laian (1922)	21.71	5.67	1.95	2.50	20.40	0.23	2.25	10.13	...	9.04	158.93	12.27	245.08
Wuhu	33.57	17.11	7.11	0.56	1.18	0.16	4.84	4.95	...	5.29	111.86	6.36	192.99
Chekiang													
Chinhai	50.54	8.65	4.77	13.06	6.06	5.53	1.04	3.66	13.23	5.83	18.34	1.19	131.90
Fukien													
Lienkiang	9.19	6.38	5.66	4.44	2.33	2.55	3.74	3.17	...	5.10	94.19	6.67	143.42
Kiangsu													
Kiangning (S)	44.06	2.03	7.07	...	...	...	7.02	8.18	...	3.84	32.14	10.85	115.19
Kiangning (T)	21.24	4.29	3.76	3.65	1.54	0.19	2.41	4.62	8.83	10.00	116.31	6.53	183.37
Wuchin	30.67	9.30	6.24	16.77	26.09	0.13	9.96	9.88	0.20	14.26	20.17	31.97	175.64
Average by localities	*33.10*	*7.37*	*5.04*	*5.25*	*10.80*	*1.10*	*4.22*	*6.48*	*3.01*	*7.15*	*95.50*	*11.63*	*190.65*
Average by 17 localities	*24.87*	*5.34*	*3.57*	*3.97*	*6.63*	*1.12*	*3.60*	*4.19*	*1.48*	*5.06*	*64.23*	*7.32*	*131.38*

*Only a few farms have the item of cash rent.

It is important to know not only the amount of expenditures for the different items but also the proportion of farms having the expense. Over one-half of the farms had cash expenditures for hired labor and nearly one-third for fertilizers and seed. Feed was purchased by 38 per cent of the farmers. Non-cash expenditure in the form of family labor occurred for three-fourths of all farms (table 39, fig. 9).

All items show nearly the same percentage variation between each other in both North and East Central China (table 40, fig. 10). Labor is the chief expenditure and amounts to nearly two-thirds of all expenses. Hired labor constitutes

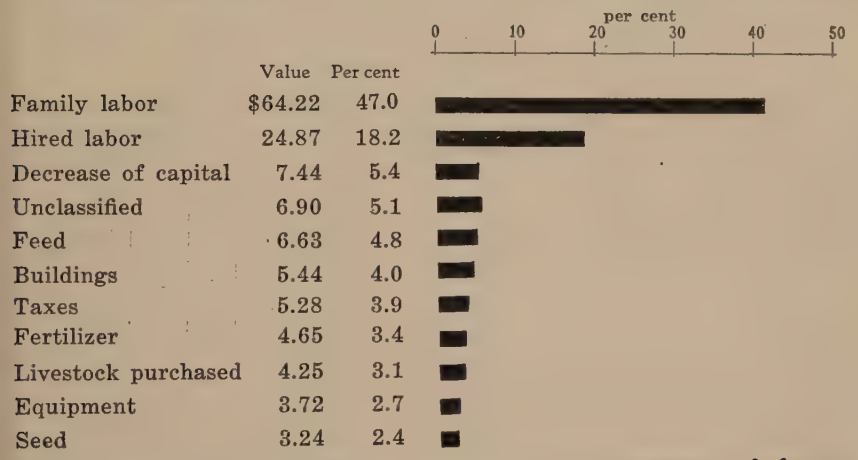

Fig. 10.—Value (Chinese currency) and proportion of farm expenditures per farm.
2866 farms, 17 regions, seven provinces, China (1921-1925).

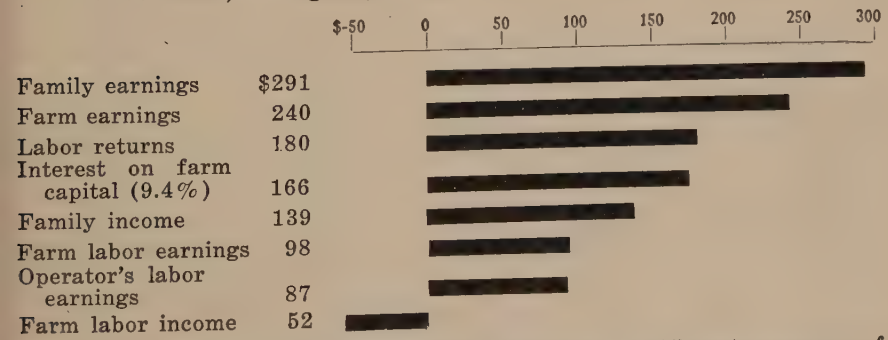

Fig. 11.—Annual profits per farm as shown by different measures of profits (Chinese currency).
2866 farms, 17 localities, seven provinces, China (1921-1925).

one-third and family labor (exclusive of the operator's labor) two-thirds per cent of the total cost of labor. One-fifth of all expenses is for hired labor and this averages $8.34 per crop hectare for all farms. A better distribution of labor on crops or the introduction of labor saving equipment might help to reduce this labor expense item. The value of all family and hired labor amounts to $89 per farm; this gives a real criterion of the extent of profitable investment in labor saving machinery, a topic which receives more thorough discussion in the chapter on labor.

The highest proportion of farm expenses for hired labor occurred at Wusiang Hsien, Shansi, and the lowest at Yen-

TABLE 33. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR OWNER OPERATORS*

1841 farms, 16 localities, six provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH EXPENSES										NON-CASH EXPENSES		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
	$	$	$	$	$	$	$	$	$	$	$	$	$
North China													
Anhwei													
Hwaiyuan	24.24	2.73	1.66	0.87	7.96	2.16	3.44	3.68	...	2.88	57.71	5.40	112.73
Su	19.65	4.98	2.53	4.57	2.68	0.56	5.50	3.44	...	7.31	23.29	7.52	82.03
Chihli													
Pingsiang	7.55	2.30	1.53	3.83	0.93	...	2.68	...	...	2.10	15.83	0.52	37.27
Yenshan (1922)	3.11	8.60	3.06	10.09	6.71	2.92	2.17	3.35	...	6.51	19.14	1.47	67.13
Yenshan (1923)	12.97	1.26	3.82	0.19	5.21	3.67	4.50	0.51	...	1.50	33.93	7.26	74.82
Honan													
Sincheng	6.93	5.89	2.09	0.83	1.45	0.15	3.97	0.91	...	3.66	62.50	0.24	88.62
Kaifeng	27.27	2.46	2.47	5.15	0.03	...	3.66	4.13	...	1.63	41.70	2.64	91.14
Shansi													
Wusiang	21.29	3.77	1.49	0.08	0.03	0.02	4.07	2.82	...	3.11	3.09	3.12	42.89
Wutai	11.99	0.96	1.17	0.46	0.64	2.38	2.09	0.77	...	1.55	48.94	5.17	76.12
Average by localities	*15.00*	*3.66*	*2.20*	*2.90*	*2.85*	*1.32*	*3.56*	*2.18*	...	*3.36*	*34.01*	*3.71*	*74.75*
East Central China													
Anhwei													
Laian (1921)	66.78	9.67	4.20	...	28.15	0.02	5.27	4.01	...	3.96	235.72	10.60	368.38
Laian (1922)	24.20	5.58	1.59	2.81	20.82	0.32	3.05	10.10	...	9.38	152.16	13.60	243.61
Wuhu	31.72	14.27	6.95	0.14	1.57	0.18	5.19	4.39	...	4.74	88.39	3.65	161.19
Fukien													
Lienkiang	4.45	3.26	2.68	2.98	2.11	0.88	6.89	2.44	...	3.18	93.88	6.15	128.90
Kiangsu													
Kiangning (S)	53.74	2.30	7.62	...	...	...	9.96	8.21	...	4.13	35.79	9.42	131.17
Kiangning (T)	31.20	4.02	4.51	5.48	1.65	0.18	5.75	5.27	...	10.22	131.73	8.37	208.38
Wuchin	36.01	12.12	6.32	17.99	27.49	0.10	12.66	9.04	...	14.95	17.62	33.18	187.48
Average by localities	*35.44*	*7.32*	*4.84*	*4.20*	*11.68*	*0.24*	*6.97*	*6.21*	...	*7.22*	*107.90*	*12.14*	*204.16*
Average by 16 localities	*23.94*	*5.26*	*3.36*	*3.47*	*6.71*	*0.85*	*5.05*	*3.94*	...	*5.05*	*66.34*	*7.40*	*131.37*

*Chinhai Hsien, Chekiang, has been omitted because of only one owner farm.

shan Hsien (1922), Chihli, where the farms are small. The high proportion for hired labor for Wusiang Hsien is offset, however, by the lowest proportion of total expenses for family labor. The highest proportion for family labor was at Kaifeng Hsien, Honan.

Items of expense other than labor vary from 5.4 per cent of the total for decrease in capital to 1.1 for cash rent of land, the latter for 7.5 per cent of all farms only.

Taxes amount to $1.92 per crop hectare and constitute 3.9 per cent of all expenses. A better measure of taxation is rate of taxation per hectare of farm area. This averages $2.64 for the seventeen localities; $1.36 for North China and $4.08

TABLE 34. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR PART OWNER OPERATORS*

446 farms, 10 localities, six provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Cash expenses										Non-cash expenses		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
	$	$	$	$	$	$	$	$	$	$	$	$	$
Anhwei													
Su	11.94	4.85	2.50	1.90	3.23	0.64	1.97	2.33	0.32	4.91	37.88	6.50	78.97
Chihli													
Pingsiang	5.20	4.61	1.06	5.10	...	...	2.50	...	2.57	1.61	14.18	0.51	37.34
Honan													
Sincheng	5.49	2.73	1.95	0.11	0.80	0.10	2.28	1.12	...	3.62	88.50	0.17	106.87
Kaifeng	39.74	6.39	3.68	8.27	0.30	...	3.83	4.98	...	2.12	53.18	4.12	126.62
Shansi													
Wusiang	13.45	3.72	1.65	...	...	0.53	2.10	2.49	0.50	2.99	4.06	1.17	32.66
Average by localities	*15.16*	*4.46*	*2.17*	*3.08*	*0.87*	*0.25*	*2.54*	*2.18*	*0.63*	*3.05*	*39.56*	*2.49*	*76.49*
East Central China													
Anhwei													
Wuhu	46.31	27.36	9.03	1.49	0.97	0.12	6.17	6.53	...	6.26	166.67	13.19	284.10
Fukien													
Lienkiang	14.25	11.04	8.99	5.05	2.86	4.44	1.58	4.06	...	6.59	95.80	8.54	163.20
Kiangsu													
Kiangning (S)	29.59	1.77	6.12	...	...	...	2.50	7.83	...	3.05	27.80	13.45	92.11
Kiangning (T)	21.88	6.99	3.68	2.83	2.29	0.35	3.11	5.11	9.66	10.50	123.76	4.86	195.01
Wuchin	15.20	1.72	5.31	11.05	21.46	...	6.07	13.18	...	10.76	26.73	29.32	140.80
North China Average by localities	*25.44*	*9.78*	*6.63*	*4.08*	*5.52*	*0.98*	*3.89*	*7.34*	*1.93*	*7.43*	*88.15*	*13.87*	*175.04*
Average by 10 localities	*20.30*	*7.12*	*4.40*	*3.58*	*3.19*	*0.62*	*3.21*	*4.76*	*1.31*	*5.24*	*63.86*	*8.18*	*125.77*

*Localities with fewer than 20 part owners have been omitted.

for East Central China. The rate varies from $0.88 per hectare in Hwaiyuan Hsien, Anhwei, to $9.46 in Wuchin Hsien, Kiangsu. In terms of acres, the average rate for the seventeen localities is $1.08 (or Gold $0.57) per acre. This may be compared with rates in the United States of Gold $0.314 per acre in 1913-14 and of Gold $0.709 per acre in 1921-22 (1).

These rates may be considered high since the farmer receives limited benefits in return.

Fertilizer, purchased by nearly one-third of the operators, amounts to only $2.04 per crop hectare for the total crop hectare area, or four per cent of all expenses.

The proportion of farms having the various expenses is shown in table 39 and fig. 9.

A study of expenses, like that of receipts, shows that the farm business is small.

TABLE 35. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR TENANT OPERATORS*

486 farms, eight localities, five provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Cash expenses										Non-cash expenses		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Live stock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
North China													
Anhwei	$	$	$	$	$	$	$	$	$	$	$	$	$
Su	18.32	1.19	2.25	1.05	6.21	0.09	...	4.43	0.04	3.77	43.05	18.33	98.73
Shansi													
Wutai	53.51	0.05	2.21	0.03	0.03	0.02	0.01	...	...	1.44	53.24	...	110.54
East Central China													
Anhwei													
Laian (1921)	45.10	2.08	3.43	2.08	31.31	...	...	10.51	...	3.44	192.51	24.02	314.48
Laian (1922)	9.10	3.81	3.67	2.13	18.57	...	...	12.40	...	8.54	177.86	7.94	244.02
Chekiang													
Chinhai	29.05	6.79	3.85	9.84	4.59	4.35	0.01	3.30	12.52	5.62	16.76	1.17	97.85
Fukien													
Lienkiang	9.27	2.36	5.27	7.36	1.46	2.27	...	2.86	...	6.80	90.32	2.72	130.69
Kiangsu													
Kiangning (T)	14.69	3.29	3.32	2.87	1.14	0.14	...	4.00	14.00	9.65	103.36	6.09	162.55
Wuchin	18.07	2.16	6.70	15.93	23.32	0.37	...	11.02	1.40	14.04	26.98	28.34	148.33
Average by localities	*20.88*	*3.42*	*4.37*	*6.70*	*13.40*	*1.19*	—	*7.35*	*4.65*	*8.02*	*101.30*	*11.71*	*182.99*
Average by eight localities	*24.64*	*2.72*	*3.84*	*5.16*	*10.83*	*0.90*	—	*6.06*	*3.50*	*6.66*	*88.01*	*11.08*	*163.40*

*Localities having less than 20 part owners have been omitted.

13. *Almost every farmer who keeps animals must be equipped with a feed cutter. This type, found in Shansi province, is especially good because of the iron teeth which keep the fodder from slipping while it is being cut.*

PROFITS

Measures and amount of profits

Profits from the farm business may be measured in a number of different ways, depending upon the purpose in mind. Results of eight of these methods are shown in fig. 11 and table 41, and it is seen that the variation is from minus $52 to $291 Obviously it is necessary to know what measure is used in any statement of farm profits, and if comparison be made with profits from other occupations, those measures must be used which are most nearly comparable.

Full explanation of the method of calculation of each of these measures of profits is given under definitions in the first

TABLE 36. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR LANDLORDS OF PART OWNER OPERATORS*

424 farms, 9 localities, five provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Cash expenses										Non-cash expenses		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
North China													
Anhwei	$	$	$	$	$	$	$	$	$	$	$	$	$
Su	...	...	...	...	...	5.66	1.78	...	...	0.35	...	...	7.79
Honan													
Sincheng	...	...	...	...	...	...	1.74	...	...	0.01	...	0.23	1.98
Kaifeng	...	...	...	...	...	...	2.93	...	...	...	...	...	2.93
Shansi													
Wusiang	...	...	...	...	...	...	1.51	...	...	...	...	...	1.51
Average by localities	...	...	...	...	...	*1.13*	*1.59*	...	...	*0.07*	...	*0.05*	*2.84*
East Central China													
Anhwei													
Wuhu	...	...	...	0.30	...	0.24	4.02	...	...	...	...	...	4.56
Fukien													
Lienkiang	...	...	...	...	...	...	3.46	...	...	...	...	...	3.46
Kiangsu													
Kiangning (S)	...	...	...	...	...	...	6.17	...	...	...	...	...	6.17
Kiangning (T)	...	...	...	0.89	...	...	2.24	...	...	0.54	...	...	3.67
Wuchin	...	...	...	...	...	...	6.38	...	...	1.23	...	...	7.61
Average by localities	...	...	...	*0.24*	...	*0.05*	*4.45*	...	...	*0.35*	...	...	*5.09*
Average by 10 localities	...	...	...	*0.12*	...	*0.59*	*3.03*	...	...	*0.21*	...	*0.62*	*3.97*

*Localities with fewer than 20 part owners have been omitted.

chapter. Where the farm is the unit these profits are computed from table 41, giving a summary of the year's business. The farm receipts and farm expenses in this table are for both the operator and the landlord, and therefore cannot be used in determining the measures of profits for the operator. In determining the latter, the operator's expenses and receipts and capital from tables 24 and 32 must be used.

Family earnings.—Briefly stated, family earnings are the most useful for comparison with incomes of other occupational groups, since everything received by the farmer has been included as a receipt and no non-cash items, such as family labor, have been deducted as expenses. The average of such family earnings is $291. Deducting the value of house rent, the mean average is $278 compared with a median average of $214 (table 42). Here, as will be seen with other measures of profits, the median gives lower values just as it does in the

TABLE 37. EXPENSES AND THEIR DISTRIBUTION PER FARM FOR LANDLORDS OF TENANT OPERATORS*

486 farms, eight localities, five provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH EXPENSES										NON-CASH EXPENSES		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
North China													
Anhwei	$	$	$	$	$	$	$	$	$	$	$	$	$
Su	...	0.09	...	0.70	...	36.68	9.72	...	...	3.35	...	...	50.54
Shansi													
Wutai	...	...	4.02	2.17	0.15	4.59	6.81	1.47	...	1.55	...	2.90	23.66
East Central China													
Anhwei													
Laian (1921)	...	2.94	...	15.82	...	31.96	6.16	...	...	5.49	...	...	62.37
Laian (1922)	...	...	0.19	2.62	...	30.76	4.78	...	...	3.81	...	...	42.16
Chekiang													
Chinhai	...	...	...	...	...	...	3.50	...	...	...	...	...	3.50
Fukien													
Lienkiang	...	...	...	...	...	...	5.24	...	...	...	...	...	5.24
Kiangsu													
Kiangning (T)	...	0.02	0.19	1.30	...	...	4.38	...	...	0.52	...	0.02	6.43
Wuchin	...	0.12	0.21	...	...	...	11.43	...	...	1.57	...	0.23	13.56
Average by eight localities	...	*0.40*	*0.58*	*2.82*	*0.02*	*13.00*	*6.50*	*0.18*	...	*2.04*	...	*0.39*	*25.93*

*Localities with fewer than 20 part owner farms have been omitted.

case of measures of size of business because of the undue influence of the few large farms. In East Central China the median family earnings are over twice as great as in North China but less than twice as great if the mean is used as a measure. The range of means between localities is from $122 to $518 (table 41). The variability of family earnings is quite large but is considerably less than for operator's labor earnings or for labor returns per farm because some of the more variable

TABLE 38. FARM EXPENSES PER CROP HECTARE FOR OPERATORS AND LANDLORDS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Cash expenses										Non-cash expenses		Total expenses per crop hectare
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
North China													
Anhwei	$	$	$	$	$	$	$	$	$	$	$	$	$
Hwaiyuan	4.28	0.52	0.28	0.22	1.47	0.37	0.61	0.70	0.10	0.49	10.46	0.90	20.40
Su	2.45	0.58	0.34	0.47	0.49	1.25	0.83	0.47	0.01	0.95	4.22	1.31	13.37
Chihli													
Pingsiang	5.87	2.15	1.19	3.28	0.65	...	2.17	...	0.31	1.65	12.71	0.42	30.40
Yenshan (1922)	1.10	3.05	1.09	3.58	2.38	1.04	0.77	1.19	...	2.31	6.79	0.52	23.82
Yenshan (1923)	2.66	0.27	0.76	0.04	1.12	0.74	0.92	0.10	...	0.32	7.06	1.44	15.43
Honan													
Sincheng	1.30	0.96	0.41	0.11	0.23	0.03	0.82	0.19	...	0.73	13.81	0.07	18.66
Kaifeng	5.49	0.61	0.50	1.07	0.02	...	0.80	0.79	...	0.32	8.09	0.54	18.23
Shansi													
Wusiang	10.17	1.92	0.79	0.04	0.01	0.05	2.05	1.40	0.04	1.60	1.76	1.43	21.26
Wutai	4.52	0.05	0.52	0.18	0.04	0.46	0.60	0.15	...	0.30	6.30	0.47	13.59
Average by localities	*4.21*	*1.12*	*0.65*	*1.00*	*0.71*	*0.44*	*1.06*	*0.56*	*0.05*	*0.96*	*7.91*	*0.79*	*19.46*
East Central China													
Anhwei													
Laian (1921)	11.46	1.49	0.79	2.01	6.13	3.44	1.20	1.55	0.38	1.40	45.12	3.66	78.63
Laian (1922)	6.54	1.71	0.60	1.00	6.14	2.60	1.07	3.05	...	3.01	47.88	3.70	77.30
Wuhu	11.31	5.77	2.39	0.22	0.40	0.08	2.25	1.67	...	1.78	37.70	2.14	65.71
Chekiang													
Chinhai	34.70	5.94	3.27	8.97	4.16	3.80	3.51	2.52	9.08	4.00	12.59	0.81	93.35
Fukien													
Lienkiang	8.03	5.58	4.95	3.89	2.04	2.23	5.16	2.77	...	4.46	82.40	5.84	127.35
Kiangsu													
Kiangning (S)	10.57	0.48	1.70	...	...	...	2.24	1.96	...	0.92	7.71	2.60	28.18
Kiangning (T)	6.28	1.27	1.14	1.32	0.46	0.06	1.48	1.37	2.61	3.07	34.42	1.93	55.41
Wuchin	14.98	4.55	3.07	8.19	12.75	0.06	6.08	4.83	0.10	7.16	9.86	15.64	87.27
Average by localities	*12.98*	*3.35*	*2.24*	*3.20*	*4.01*	*1.53*	*2.87*	*2.47*	*1.52*	*3.23*	*34.71*	*4.54*	*76.65*
Average by 17 localities	*3.34*	*2.17*	*1.40*	*2.04*	*2.26*	*0.95*	*1.92*	*1.45*	*0.74*	*2.03*	*20.52*	*2.55*	*46.37*

factors are not included in the determination of these family earnings.

The standard deviation is $207.84 and the coefficient of variability is 74.57 per cent (table 42).

The exact significance of these family earnings is better understood when put on a per capita or per adult-male unit

TABLE 39. PERCENTAGE OF FARMS HAVING THE SPECIFIED FARM EXPENSES

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Cash expenses										Non-cash expenses	
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital
North China												
Anhwei												
Hwaiyuan	37.9	67.7	74.2	8.1	50.8	67.7	100.0	14.5	7.3	95.2	99.2	42.7
Su	62.2	86.0	90.9	20.6	31.8	16.1	100.0	54.9	0.7	98.6	80.1	50.7
Chihli												
Pingsiang	30.3	34.2	88.8	37.5	5.3	...	100.0	...	4.6	100.0	47.4	59.9
Yenshan (1922)	33.3	95.3	84.7	82.7	59.3	79.3	100.0	66.0	...	100.0	44.7	26.0
Yenshan (1923)	43.6	41.4	91.0	4.5	42.1	85.0	100.0	32.3	...	57.9	61.7	51.1
Honan												
Sincheng	41.7	87.5	97.9	...	9.0	8.3	100.0	43.8	...	98.6	97.9	10.4
Kaifeng	40.3	72.5	99.3	70.5	2.7	...	100.0	67.8	...	98.7	87.2	27.0
Shansi												
Wusiang	30.7	66.1	91.2	0.8	0.4	2.4	100.0	27.5	0.4	99.6	8.0	25.5
Wutai	99.6	5.3	95.1	4.0	4.0	40.7	100.0	15.5	...	99.6	98.2	34.1
Average by localities	*46.6*	*61.8*	*90.3*	*25.4*	*22.8*	*33.3*	*100.0*	*35.3*	*1.4*	*94.2*	*69.4*	*36.4*
East Central China												
Anhwei												
Laian (1921)	64.4	15.8	70.3	28.7	92.1	30.7	100.0	88.1	3.0	95.0	100.0	44.6
Laian (1922)	46.0	28.0	35.0	11.0	92.0	4.0	100.0	93.0	...	99.0	100.0	62.0
Wuhu	31.4	63.7	92.2	9.8	14.7	7.8	100.0	73.5	...	100.0	97.1	47.1
Chekiang												
Chinhai	98.5	89.6	95.5	100.0	95.5	100.0	100.0	92.5	70.1	100.0	86.6	32.8
Fukien												
Lienkiang	32.9	54.0	72.7	57.8	37.9	55.3	100.0	62.7	...	76.4	100.0	44.1
Kiangsu												
Kiangning (S)	68.5	55.7	100.0	...	...	...	100.0	64.5	...	47.8	38.4	75.9
Kiangning (T)	86.2	85.3	97.7	41.9	34.1	9.2	100.0	95.9	37.3	99.1	97.7	70.0
Wuchin	48.7	60.3	96.7	51.3	73.7	6.3	100.0	67.7	3.3	98.3	39.7	79.0
Average by localities	*59.6*	*56.6*	*82.5*	*37.6*	*55.0*	*26.7*	*100.0*	*79.7*	*14.2*	*89.5*	*82.4*	*56.9*
Average by 17 localities	*52.7*	*59.3*	*86.7*	*31.1*	*38.0*	*30.2*	*100.0*	*56.5*	*7.5*	*92.0*	*75.5*	*46.1*

basis. Such earnings amount to $52.19 per capita per year, or $4.35 per month, and represent the money value per person, young and old, available for all expenditures and savings, in which house rent and amount of produce from the farm are given a money value. Family earnings per adult-male unit average $65.51 (table 8, chapter IV). The variation between

TABLE 40. PERCENTAGE DISTRIBUTION OF OPERATOR'S AND LANDLORD'S EXPENSE ITEMS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CASH EXPENSES										NON-CASH EXPENSES		Total expenses per farm
	Hired labor	Buildings and their repairs	Tools and their repairs	Fertilizers	Feed	Seed	Taxes	Livestock purchased	Cash rent	Unclassified	Family labor	Decrease of capital	
North China													
Anhwei													
Hwaiyuan	21.0	2.5	1.4	1.1	7.2	1.8	3.0	3.4	0.5	2.4	51.3	4.4	100.0
Su	18.3	4.4	2.6	3.5	3.6	9.4	6.2	3.5	0.1	7.1	31.5	9.8	100.0
Chihli													
Pingsiang	19.3	7.1	3.9	10.8	2.1	...	7.1	...	1.0	5.5	41.8	1.4	100.0
Yenshan (1922)	4.6	12.8	4.6	15.0	10.0	4.4	3.2	5.0	...	9.7	28.5	2.2	100.0
Yenshan (1923)	17.2	1.8	4.9	0.2	7.3	4.8	5.9	0.7	...	2.1	45.8	9.3	100.0
Honan													
Sincheng	7.0	5.2	2.2	0.6	1.2	0.1	4.4	1.0	...	3.9	74.0	0.4	100.0
Kaifeng	30.1	3.3	2.8	5.9	0.1	...	4.4	4.3	...	1.7	44.4	3.0	100.0
Shansi													
Wusiang	47.8	9.1	3.7	0.2	0.1	0.2	9.6	6.6	0.2	7.5	8.3	6.7	100.0
Wutai	33.3	0.4	3.8	1.4	0.3	3.3	4.4	1.1	...	2.2	46.4	3.4	100.0
Percentage	*21.4*	*4.3*	*3.1*	*3.7*	*3.6*	*2.9*	*4.9*	*2.8*	*0.2*	*4.1*	*44.5*	*4.5*	*100.0*
East Central China													
Anhwei													
Laian (1921)	14.6	1.9	1.0	2.6	7.8	4.4	1.5	1.9	0.4	1.8	57.4	4.7	100.0
Laian (1922)	8.5	2.2	0.8	1.3	7.9	3.4	1.4	3.9	...	3.9	61.9	4.8	100.0
Wuhu	17.2	8.3	3.7	0.3	0.6	0.1	3.4	2.5	...	2.7	57.4	3.3	100.0
Chekiang													
Chinhai	37.2	6.4	3.5	9.6	4.4	4.1	3.7	2.7	9.7	4.3	13.5	0.9	100.0
Fukien													
Lienkiang	6.3	4.4	3.9	3.0	1.6	1.8	4.0	2.2	...	3.5	64.7	4.6	100.0
Kiangsu													
Kiangning (S)	37.5	1.7	6.0	...	...	...	7.9	7.0	...	3.3	27.4	9.2	100.0
Kiangning (T)	11.3	2.3	2.1	2.4	0.8	0.1	2.7	2.5	4.7	5.5	62.1	3.5	100.0
Wuchin	17.2	5.2	3.5	9.4	14.6	0.1	7.0	5.5	0.1	8.2	11.3	17.9	100.0
Percentage	*16.7*	*3.3*	*2.5*	*3.3*	*5.4*	*2.1*	*3.4*	*3.3*	*1.5*	*3.9*	*43.2*	*5.9*	*100.0*
Percentage, 17 localities	*18.2*	*4.0*	*2.7*	*3.4*	*4.8*	*2.4*	*3.9*	*3.1*	*1.1*	*4.0*	*47.0*	*5.4*	*100.0*

TABLE 41. SUMMARY OF THE YEAR'S BUSINESS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Farm receipts						Farm expenses					Farm earnings (farm receipts minus farm expenses)
	Crop sales	Animal products sold	Other cash receipts	Products from the farm used by the family	Increase in capital	Total	Hired labor (including board)	Value of family labor (unpaid)	Cash expenditure (other than hired labor)	Decrease of capital	Total	
North China												
Anhwei												
Hwaiyuan	$50.63	$11.34	$5.75	$118.01	$7.77	$193.50	$23.92	$58.49	$26.61	$5.01	$114.03	$79.47
Su	124.97	15.68	15.63	151.20	5.84	313.32	17.68	30.44	38.91	9.45	96.48	216.84
Chihli												
Pingsiang	60.64	2.35	12.72	61.03	2.29	139.03	7.11	15.39	13.79	0.51	36.80	102.23
Yenshan (1922)	81.50	4.06	2.12	70.15	9.97	167.80	3.11	19.14	43.41	1.47	67.13	100.67
Yenshan (1923)	24.75	4.48	12.56	93.13	3.07	137.99	13.04	34.66	20.93	7.05	75.68	62.31
Honan												
Sincheng	100.28	11.20	37.06	191.97	23.87	364.38	6.63	70.57	17.77	0.38	95.35	269.03
Kaifeng	136.04	12.42	14.13	291.21	6.37	460.17	30.03	44.24	22.41	2.97	99.65	360.52
Shansi												
Wusiang	68.98	8.88	1.42	76.50	3.35	159.13	19.44	3.36	15.11	2.73	40.64	118.49
Wutai	311.91	6.92	0.13	238.62	11.60	569.18	36.98	51.53	18.75	3.81	111.07	458.11
Average by localities.	*106.63*	*8.59*	*11.28*	*143.54*	*8.24*	*278.28*	*17.55*	*36.42*	*24.19*	*3.71*	*81.87*	*196.41*
East Central China												
Anhwei												
Laian (1921)	396.03	55.01	25.86	251.68	10.58	739.16	53.85	212.08	86.43	17.21	369.57	369.59
Laian (1922)	175.51	32.47	25.70	151.60	5.01	390.29	21.71	158.93	63.71	12.27	256.62	133.67
Wuhu	238.98	16.67	7.64	193.48	4.01	460.78	33.57	111.86	43.20	6.67	194.99	265.79
Chekiang												
Chinhai	276.91	27.10	47.56	53.20	12.20	416.97	50.54	18.34	65.90	1.19	135.97	281.00
Fukien												
Lienkiang	327.08	34.62	53.29	183.03	17.88	615.90	9.19	94.19	35.52	6.67	145.57	470.33
Kiangsu												
Kiangning (S)	364.70	35.12	14.99	131.89	0.77	547.47	44.06	32.14	30.45	10.85	117.50	429.97
Kiangning (T)	100.72	61.00	71.93	99.99	1.61	335.25	21.24	116.31	43.17	6.53	187.25	148.00
Wuchin	100.05	83.64	4.62	194.04	3.43	385.78	30.67	20.17	95.76	32.00	178.60	207.18
Average by localities.	*247.50*	*43.20*	*31.45*	*157.36*	*6.94*	*486.45*	*33.10*	*95.50*	*58.02*	*11.64*	*198.26*	*288.19*
Average by 17 localities	*172.92*	*24.88*	*20.77*	*150.05*	*7.62*	*376.24*	*24.87*	*64.22*	*40.11*	*7.44*	*136.64*	*239.60*

(Continued)

TABLE 41—*(Continued)*

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Interest on capital at 8 per cent	Farm labor earnings (farm earnings minus interest on capital)	Farm labor income (farm labor earnings minus value of farm products used by the family)	Operator's labor earnings	Labor returns	Operator's family income*	Income from other than farm sources	Estimated rental value of farm residence	Operator's family earnings (less rental value of farm residence)	Operator's family earnings	Annual operator's family earnings per capita	Per cent return on capital invested
North China												
Anhwei												
Hwaiyuan	$82.59	$–3.12	$–121.13	–2.91	80.97	$44.20	$30.33	$6.70	$164.97	$171.67	$33.01	3.0
Su	146.51	70.33	–80.87	73.36	124.65	102.67	45.47	4.35	250.21	254.56	37.77	9.7
Chihli												
Pingsiang	75.29	26.94	–34.09	27.39	50.12	65.05	11.58	9.24	127.86	137.10	30.88	7.0
Yenshan (1922)	60.99	39.68	–30.47	39.66	102.30	56.49	15.33	9.24	135.14	144.38	26.99	9.8
Yenshan (1923)	126.47	–64.16	–157.29	–63.48	–15.00	24.74	17.17	8.59	113.77	122.36	23.67	0.9
Honan												
Sincheng	181.06	87.97	–104.00	91.04	170.58	126.07	33.52	8.40	340.24	348.64	50.02	10.8
Kaifeng	185.49	175.03	–116.18	174.55	250.29	98.15	7.68	12.99	392.76	405.75	51.82	14.0
Shansi												
Wusiang	68.13	50.36	–26.14	51.29	76.57	77.04	35.42	6.59	154.12	160.71	35.63	6.9
Wutai	180.59	277.52	38.90	108.45	198.20	89.45	...	14.38	197.20	211.58	...	18.1
Average by localities.	*123.01*	*73.39*	*–70.14*	*55.49*	*115.41*	*75.98*	*21.83*	*8.94*	*208.47*	*217.42*	*36.22*	*8.9*
East Central China												
Anhwei												
Laian (1921)	178.10	191.49	–60.19	132.01	399.87	198.04	...	17.76	443.09	460.85	83.34	12.8
Laian (1922)	123.06	10.61	–140.99	19.94	205.13	208.10	82.26	13.56	352.44	366.00	63.99	3.2
Wuhu	249.19	16.60	–176.88	55.56	203.92	168.33	...	11.36	359.38	370.74	66.56	6.2
Chekiang												
Chinhai	143.86	137.14	83.94	134.83	205.59	162.14	...	21.89	217.39	239.24	46.10	10.6
Fukien												
Lienkiang	183.65	286.68	103.65	258.75	364.28	318.87	...	17.57	481.45	499.02	99.41	16.3
Kiangsu												
Kiangning (S)	176.89	253.08	121.19	255.75	333.82	375.02	60.44	24.80	493.17	517.97	89.77	16.7
Kiangning (T)	128.91	19.09	–80.90	41.27	182.08	159.68	22.70	5.85	254.70	260.55	39.66	5.2
Wuchin	115.44	91.74	–102.30	88.61	144.64	90.70	47.08	19.23	256.20	275.43	56.56	9.2
Average by localities.	*162.39*	*125.80*	*–31.56*	*123.34*	*254.92*	*210.11*	*26.56*	*16.50*	*357.23*	*373.73*	*68.17*	*10.6*
Average by 17 localities	*141.54*	*98.06*	*–51.99*	*87.42*	*181.06*	*139.10*	*24.06*	*12.50*	*278.48*	*290.97*	*52.19*	*9.4*

*These amounts are for the operators alone and therefore can not be computed in this table from the farm receipts and farm expenses which include items for the landlord.

regions of family earnings per capita is from $23.67 per year for Yenshan Hsien (1923), Chihli, to $99.41 per year for Lienkiang Hsien, Fukien. Comparing North and East Central China, the annual operator's family earnings per capita is 1.9 times greater in East Central China.

TABLE 42. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF FAMILY EARNINGS*

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	164.97± 7.94	131.03± 9.95	131.02± 5.61	79.42± 5.10
Su	250.21±11.30	170.43±14.16	283.09± 7.98	113.14± 6.02
Chihli				
Pingsiang	127.86± 7.28	97.79± 9.12	133.02± 5.15	104.04± 7.16
Yenshan (1922)	135.14± 5.43	110.75± 6.81	98.54± 3.83	72.92± 4.07
Yenshan (1923)	113.77± 5.23	88.50± 6.55	89.47± 3.70	78.64± 4.87
Honan				
Sincheng	340.24±11.55	281.85±14.48	205.44± 8.16	60.38± 3.15
Kaifeng	392.76±10.36	354.81±12.98	187.38± 7.33	47.71± 2.25
Shansi				
Wusiang	154.12± 5.22	126.95± 6.54	122.47± 3.69	79.46± 3.60
Wutai	197.20± 3.18	177.15± 3.99	70.77± 2.24	35.89± 1.28
Average by localities	*208.47*	*131.03*	*146.80*	*74.62*
East Central China				
Anhwei				
Laian (1921)	443.09±12.37	432.84±15.50	184.36± 8.76	41.61± 2.29
Laian (1922)	352.44±15.23	318.95±19.09	225.69±10.77	64.04± 4.12
Wuhu	359.38±21.29	266.86±26.68	318.64±15.05	88.66± 6.71
Chekiang				
Chinhai	217.39±11.09	188.33±13.90	134.54± 7.84	61.89± 4.80
Fukien				
Lienkiang	481.45±30.04	344.05±37.65	564.68±21.23	117.29± 8.54
Kiangsu				
Kiangning (S)	493.17±21.16	398.44±26.52	447.36±14.99	90.71± 4.94
Kiangning (T)	254.70± 7.28	214.69± 9.12	158.88± 5.15	62.38± 2.69
Wuchin	256.20± 6.92	213.60± 8.67	177.90± 4.89	69.44± 2.68
Average by localities	*357.23*	*294.08*	*276.51*	*74.50*
Average by 17 localities	*278.48*	*213.60*	*207.84*	*74.57*

*The value of house rent, averaging $12.50 per family, was not included in these family earnings.

The lowest per capita earnings are, as might be expected, for the localities subject to famine and this is shown in Yenshan Hsien (1923), Chihli, where the wheat crop was a failure because of drought. It is in this same locality that farmers are too poor to drink tea or even to boil their drinking water because of the fuel cost.

Family income.—From a social viewpoint, perhaps, the next important measure of profits is the operator's family income, which represents the cash balance the operator has after subtracting all cash expenses from all cash receipts and adding thereto any other net cash income. Such income averages $139 and is the amount of money available as a result of the year's work for all wants other than food, raw materials for clothing, and house rent supplied by the farm (table 41). The family income is nearly three times as great for East Central as for North China and it varies between localities from $24.74 for Yenshan Hsien (1923), Chihli, where the wheat crop was a failure, to $375 for Lienkiang Hsien, Fukien.

Operator's labor earnings.—Another measure of profits from the individual operator's viewpoint is that of operator's labor earnings, which shows earnings received by the operator for his labor and managing ability. It is obtained by subtracting the operator's cash and non-cash expenses from his cash and non-cash receipts and from this deducting the interest charge of eight per cent on the average annual capital investment. It is the best business measure of profits because it assumes that the value of investments in land, buildings, livestock, equipment, and supplies could earn interest if liquidated. Where such property is inherited the operator in some cases is saddled with expensive buildings. In other instances valuations may be too high or too low. Such conditions tend to minimize the importance of operator's labor earnings as a measure of the business ability of the farmer. Operator's labor earnings show a mean average of $87 compared with a median average of $51 (table 43). They are a little over twice as great for East Central as for North China and the median range beween localities is from minus $35.00 at Yenshan Hsien (1923), Chihli, where crop failures occurred, to $217 for Kiangning Hsien (S), Kiangsu.

The variability of operator's labor earnings is high as is shown by the standard deviation of $103.32 and the coefficient

of variability of 135.09 per cent (table 43). Such high variability is caused by the large number of factors that determine operator's labor earnings.

Nearly one-half of the operators made labor earnings in the modal group 0-$99 (table 44). Over one-third made labor earnings above $100, while one-sixth lost money on their

TABLE 43. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF OPERATOR'S LABOR EARNINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan ..	$–2.91± 3.99	$–2.86± 5.00	$65.91± 2.82	*2264.95±3106.93
Su	73.36± 4.23	51.28± 5.30	106.07± 2.99	144.59± 9.28
Chihli				
Pingsiang ..	27.39± 2.53	18.36± 3.17	46.20± 1.79	168.67±16.89
Yenshan (1922)	39.68± 3.02	37.00± 3.79	54.86± 2.13	138.23±11.81
Yenshan (1923)	–63.48± 4.75	–35.50± 5.95	81.25± 3.36	127.99±10.96
Honan				
Sincheng ..	91.04± 5.84	71.49± 7.32	103.89± 4.12	114.11± 8.60
Kaifeng ..	174.55± 4.30	154.32± 5.39	77.78± 3.04	44.56± 2.06
Shansi				
Wusiang ..	51.29± 1.95	46.06± 2.44	45.77± 1.38	89.24± 4.32
Wutai	108.45± 2.15	101.41± 2.69	47.80± 1.52	44.08± 1.65
Average by localities ..	*55.49*	*46.06*	*69.95*	*108.93*
East Central China				
Anhwei				
Laian (1921) ..	132.01±11.69	104.88±14.65	174.17± 8.27	131.94±13.27
Laian (1922) ..	19.94± 4.77	13.81± 5.98	70.67± 3.37	354.41±86.40
Wuhu	55.56± 9.40	31.98±11.78	140.72± 6.64	253.28±44.46
Chekiang				
Chinhai	134.83± 6.67	125.76± 8.36	80.91± 4.72	60.01± 4.59
Fukien				
Lienkiang ..	258.75±17.66	176.47±22.13	331.98±12.48	128.30±10.00
Kiangsu				
Kiangning (S)	255.75± 6.62	216.87± 8.30	139.95± 4.69	54.72± 2.32
Kiangning (T)	41.27± 3.36	47.83± 4.21	73.33± 2.38	177.68±15.57
Wuchin	88.61± 4.47	79.02± 5.60	114.90± 3.16	129.67± 7.53
Average by localities ..	*123.34*	*91.95*	*140.83*	*161.25*
Average by 17 localities	*87.42*	*51.28*	*103.30*	*135.09*

*Has not been included in the average. This high coefficient is a striking example of the effect of low mean values. It has been carefully checked but has not been included in the average.

year's business. A frequency polygon shows an asymetrical curve (fig. 12). A number of localities have a model group of labor earnings above or below 0-$99 the cause for which

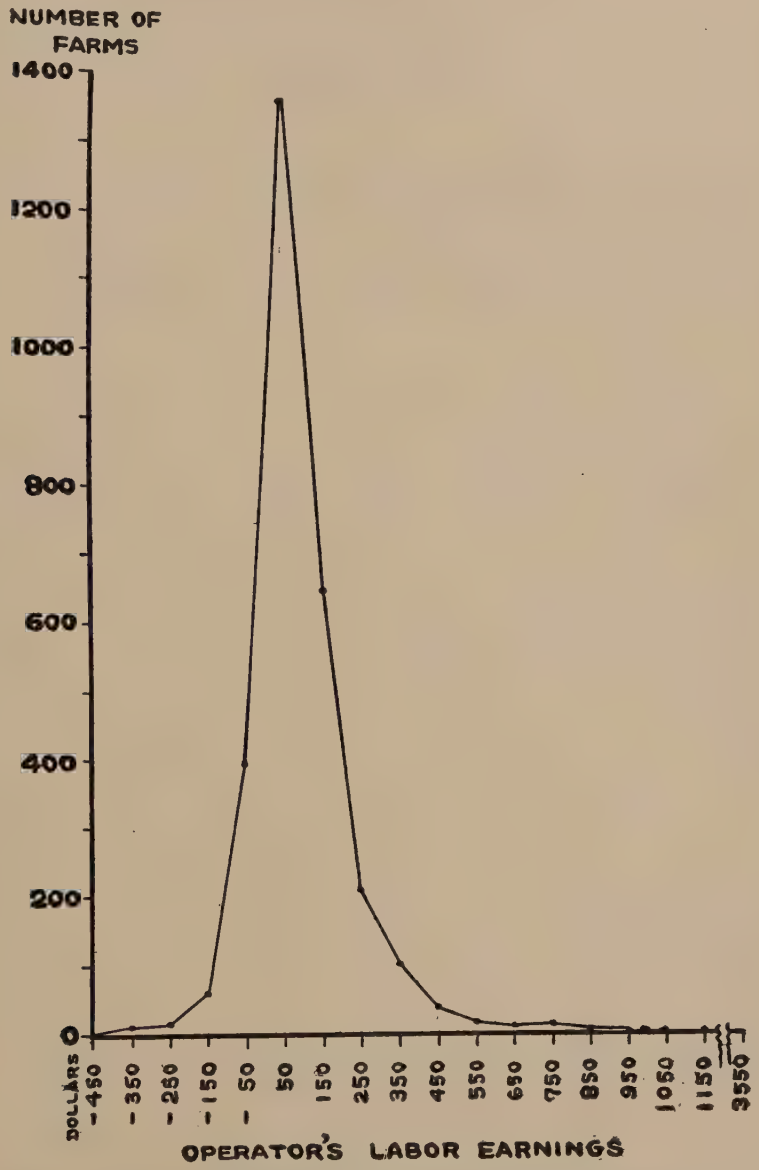

Fig. 12.—Frequency distribution of operator's labor earnings. 2866 farms, 17 localities, seven provinces, China (1921-1925).

depends largely upon whether or not the year was a normal one. Yenshan Hsien, Chihli is an instance of this. The study in 1922 was for a normal year while that for 1923 was for a year in which the wheat crop was nearly a failure. The extreme variation in the distribution of operator's labor earnings from the lowest to the highest is a difference of $4400 and is caused by a few exceptionally large farms and by variations in crop years.

Farm labor earnings.—Farm labor earnings are similar to operator's labor earnings except that the farm rather than the operator is taken as the unit. It is used for tenant and part owner farms to measure profits as if the investment, receipts, and expenses all belonged to the operator. The amount of such earnings average $98 and are $11 greater than operator's

TABLE 44. VARIATION IN OPERATOR'S LABOR EARNINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Number of farms in each $100 class interval represented by the midpoint of the class																
	-450	-350	-250	-150	-50	+50	150	250	350	450	550	650	750	850	950	1050	1150	3550
North China																		
Anhwei																		
Hwaiyuan	...	1	1	2	70	44	6	...	...	...	...	...	...	...	...	...	...	...
Su	1	...	1	2	34	165	57	17	7	1	...	...	...	1	...	...	...	...
Chihli																		
Pingsiang	...	...	...	2	28	111	10	1	...	...	...	...	...	...	...	...	...	...
Yenshan (1922)	...	...	1	2	11	123	12	...	1	...	...	...	...	...	...	...	...	...
Yenshan (1923)	...	3	7	24	74	25	...	...	...	...	...	...	...	...	...	...	...	...
Honan																		
Sincheng	...	...	...	...	14	84	32	6	3	4	1	...	...	...	...	...	...	...
Kaifeng	...	...	...	...	...	28	75	32	7	4	3	...	...	...	...	...	...	...
Shansi																		
Wusiang	...	...	1	1	14	206	27	2	...	...	...	...	...	...	...	...	...	...
Wutai	...	...	...	...	...	110	103	11	2	...	...	...	...	...	...	...	...	...
Total	*1*	*4*	*11*	*33*	*245*	*896*	*322*	*69*	*20*	*9*	*4*	...	...	*1*	...	...	...	...
East Central China																		
Anhwei																		
Laian (1921)	1	...	...	7	12	30	16	13	18	3	1	...	...	...	...	...	...	...
Laian (1922)	...	...	...	1	40	46	11	1	1	...	...	...	...	...	...	...	...	...
Wuhu	...	2	1	8	24	43	19	5	3	...	1	...	1	...	...	...	...	...
Chekiang																		
Chinhai	...	...	...	...	1	23	34	6	2	1	...	...	...	...	...	...	...	...
Fukien																		
Lienkiang	...	1	...	...	...	36	58	26	14	6	6	5	4	2	...	1	1	1
Kiangsu																		
Kiangning (S)	...	...	...	...	1	9	74	65	32	11	3	2	5	...	1	...	...	...
Kiangning (T)	...	...	1	8	44	124	35	5	...	...	...	...	...	...	...	...	...	...
Wuchin	...	3	1	6	27	151	76	20	10	6	...	...	...	...	...	...	...	...
Total	*1*	*6*	*3*	*25*	*149*	*462*	*323*	*141*	*80*	*27*	*11*	*7*	*10*	*2*	*1*	*1*	*1*	*1*
Total 17 localities	*2*	*10*	*14*	*58*	*394*	*1353*	*645*	*210*	*100*	*36*	*15*	*7*	*10*	*3*	*1*	*1*	*1*	*1*

labor earnings (table 41). The difference, however, does not necessarily represent an additional profit taken by the landlord because the localities which make up the averages are not identical. An examination of these two measures by localities shows very nearly similar values for most localities. This is because on owner farms interest on investment in land and buildings is a charge which offsets the rent charge on tenant farms.

Farm labor income.—Farm labor income is the most unsatisfactory measure because unlike farm labor earnings it omits as a receipt produce used by the family from the farm. In China such produce amounts to so large a proportion of the total that an entirely erroneous idea is obtained from the average farm labor income for all farms, which is minus $52 (table 41).

Farm earnings.—Farm earnings represent the difference between cash and non-cash expenses and cash and non-cash receipts for both the operator and the landlord. Interest on investment is not deducted. Farm earnings for the whole farm as a unit average $240 and vary from $62 to $470 (table 41).

Interest on capital investment.—Interest on the capital investment is a measure little used because the farmer's major investment is labor and not capital and the important thing to know is the return on labor and managing ability rather than on capital.

Such interest averages $142 per farm. The rate of interest averages 9.4 per cent per annum and varies between localities from 0.9 in Yenshan Hsien, Chihli, where crops were a failure, to 18.1 per cent in Wutai Hsien, Shansi (table 41). Such a rate may be used by rural banks as a criterion of how much interest a farmer can afford to pay on borrowed money. The reason why more farmers are not using improved practices is not solely a lack of knowledge but a lack of credit facilities at a reasonable price.

Labor returns.—From the standpoint of the agricultural industry as whole, labor returns per farm may be used to measure the welfare of all agricultural workers rather than of the operator alone. In determining labor returns no charge has been made for labor. Labor returns per farm show a mean for the seventeen localities of $181 (table 41) and a

median of $136 (table 45). For both types of averages they are over twice as great in East Central as in North China. They are greater than operator's labor earnings because the returns to all laborers are included. Labor returns per man-equivalent (table 10, chapter IV) when compared with operator's labor earnings show that labor is well paid since both amounts are nearly the same.

TABLE 45. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF LABOR RETURNS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	80.97± 4.79	58.00± 6.00	78.97± 3.38	97.53± 7.09
Su	124.65± 4.68	100.44± 5.87	117.21± 3.31	94.03± 4.41
Chihli				
Pingsiang	50.12± 2.66	38.84± 3.33	48.55± 1.88	96.87± 6.36
Yenshan (1922)	102.30± 7.61	75.92± 9.54	138.13± 5.37	135.02±11.32
Yenshan (1923)	–15.00± 3.03	–6.33± 3.80	51.75± 2.14	345.00±71.13
Honan				
Sincheng	170.58± 6.59	135.99± 8.26	117.31± 4.66	68.77± 3.81
Kaifeng	250.29± 7.81	216.64± 9.79	141.22± 5.52	56.42± 2.82
Shansi				
Wusiang	76.57± 2.38	59.59± 2.98	55.87± 1.68	72.97± 3.16
Wutai	198.20± 2.84	186.92± 3.56	63.29± 2.01	31.93± 1.11
Average by localities	*115.41*	*75.92*	*90.26*	*110.95*
East Central China				
Anhwei				
Laian (1921)	399.87±12.27	366.34±15.38	182.90± 8.69	45.74± 2.59
Laian (1922)	205.13± 7.51	176.82± 9.41	111.21± 5.30	54.21± 3.26
Wuhu	203.92±14.88	132.68±18.65	222.78±10.52	109.25± 9.49
Chekiang				
Chinhai	205.59±10.66	182.37±13.36	129.34± 7.54	62.91± 4.91
Fukien				
Lienkiang	364.28±20.75	249.12±26.00	389.95±14.66	107.05± 7.30
Kiangsu				
Kiangning (S)	333.82±10.16	271.73±12.73	214.79± 7.20	64.34± 2.91
Kiangning (T)	182.08± 4.42	162.29± 5.54	96.55± 3.13	53.03± 2.15
Wuchin	144.64± 5.14	114.92± 6.44	132.03± 3.63	91.28± 4.10
Average by localities	*254.92*	*179.60*	*184.94*	*73.48*
Average by 17 localities	*181.06*	*135.99*	*134.81*	*93.31*

The variability of labor returns is fairly high, as the standard deviation is $135 and the coefficient of variability is 93.31 per cent (table 45).

Labor returns per man-equivalent.—Labor returns per man-equivalent would be a good measure of the welfare of the individual farm laborer if such returns were actually divided among all laborers. They indicate whether or not operator's and family and hired labor is receiving more or less than the equivalent of current farm wages. The labor returns per man-equivalent of $84 (table 46) are almost the same as operator's labor earnings of $87.00. Medians are $60 (table 46) and $51 respectively.

Actual wages paid year farm laborers average for the seventeen localities $58, which includes value of board, and shows that farm laborers are receiving a smaller reward for their labor than do members of the family or the operator, although the latter should have something for his managerial ability.

The variability of labor returns per man-equivalent is 52.95 per cent, shown by the coefficient of variation (table 46). It is considerably lower than for labor returns because the effect of varying size of family.

Net profits per crop hectare.—Another important measure of profits is net profits per unit of land area, such as per hectare or per acre. While labor returns per man-equivalent are of primary importance in countries where land is abundant and labor expensive, yet net profits per unit of land area are a better measure in a densely populated country where land is scarce and labor cheap.

Net profits per crop hectare measure both income per man and income per hectare in that there can be no profit until the agricultural workers are paid the current farm wage; then any net increase of receipts above expenses from more intensive methods represents income in addition to wages.

Net profits per crop hectare, therefore, show a mean average of $11.86 or a median average of $7.09 (table 47). Farmers in those localities where minus net profits occur are not making even wages, but in most cases this is because of low yields of crops during the particular year studied.

The variability of net profits per crop hectare is very great as is shown by the standard deviation of $44.81 and the coefficient of variability of 228.20 per cent (table 47). So

TABLE 46. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY OF LABOR RETURNS PER MAN-EQUIVALENT

2866 farms, 17 localities, seven provinces, China (1921-25)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficient of variability
North China				
Anhwei				
Hwaiyuan ..	33.92±1.46	29.83±1.83	24.13±1.03	71.14±4.32
Su	77.86±2.47	70.43±3.10	61.93±1.75	79.54±3.38
Chihli				
Pingsiang ..	37.38±1.82	28.11±2.28	33.23±1.29	88.90±5.52
Yenshan (1922)	65.73±2.97	52.04±3.72	53.90±2.10	82.00±4.88
Yenshan (1923)	–5.00±1.57	–5.17±1.97	26.86±1.11	*537.20±170.43
Honan				
Sincheng	49.98±1.60	44.71±2.01	28.48±1.13	56.98±2.90
Kaifeng	101.58±1.75	99.67±2.19	31.59±1.24	31.10±1.33
Shansi				
Wusiang	62.94±1.33	57.16±1.67	31.11±0.94	49.43±1.82
Wutai	75.40±0.79	73.90±0.99	17.58±0.56	23.32±0.78
Average by localities ..	*55.53*	*52.04*	*34.31*	*60.30*
East Central China				
Anhwei				
Laian (1921) ..	87.38±2.29	82.37±2.87	34.13±1.62	39.06±2.12
Laian (1922) ..	61.78±1.33	58.08±1.67	19.75±0.94	31.97±1.67
Wuhu	63.93±2.36	59.02±2.96	35.31±1.67	55.23±3.31
Chekiang				
Chinhai	114.04±3.31	114.22±4.15	40.16±2.34	35.22±2.29
Fukien				
Lienkiang ..	204.23±6.74	178.28±8.45	126.61±4.76	61.99±3.10
Kiangsu				
Kiangning (S).	183.40±2.74	180.91±3.43	57.83±1.94	31.53±1.16
Kiangning (T).	60.59±1.14	59.85±1.43	24.92±0.81	41.13±1.54
Wuchin	151.48±4.06	142.28±5.09	104.32±2.87	68.87±2.64
Average by localities ..	*115.85*	*98.30*	*55.38*	*45.63*
Average by 17 localities ..	*83.92*	*59.85*	*44.23*	*52.95*

*This has not been included in the average see note to table 43.

many factors have a part in determining net profits per crop hectare that variability must be very high.

Income from Supplementary Work

Nearly one-half of all farmers in twelve localities had some income from sources other than the farm (table 48). The

TABLE 47. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF NET PROFITS PER CROP HECTARE

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	−16.40± 1.97	−8.14± 2.47	32.55± 1.39	198.48± 25.30
Su	6.46± 0.85	7.09± 1.07	21.39± 0.60	331.11± 44.74
Chihli				
Pingsiang	−15.91± 4.12	−6.19± 5.16	75.32± 2.91	473.41±135.64
Yenshan (1922)	3.47± 1.39	5.08± 1.74	25.14± 0.98	724.50±290.35
Yenshan (1923)	−25.64± 2.87	−24.15± 3.60	49.05± 2.03	191.30± 22.84
Honan				
Sincheng	12.04± 0.92	12.19± 1.15	16.35± 0.65	135.80± 11.67
Kaifeng	18.26± 0.74	18.95± 0.93	13.44± 0.53	73.60± 4.15
Shansi				
Wusiang	−6.91± 1.22	−2.92± 1.53	28.73± 0.86	415.77± 74.61
Wutai	23.36± 0.53	25.78± 0.66	11.76± 0.37	50.34± 1.96
Average by localities	*−0.14*	*5.08*	*30.41*	*288.26*
East Central China				
Anhwei				
Laian (1921)	19.03± 3.09	22.11± 3.87	46.03± 2.19	241.88± 40.95
Laian (1922)	−27.73± 3.23	−19.75± 4.05	47.84± 2.28	172.52± 21.76
Wuhu	−32.77± 3.54	−30.24± 4.44	52.93± 2.50	161.52± 19.01
Chekiang				
Chinhai	29.05± 4.88	20.27± 6.12	59.21± 3.45	203.82± 36.26
Fukien				
Lienkiang	141.96± 9.60	129.12±12.03	180.48± 6.79	127.13± 10.07
Kiangsu				
Kiangning (S)	54.21± 1.64	45.36± 2.06	34.76± 1.16	64.12± 2.90
Kiangning (T)	−12.47± 0.97	−11.65± 1.22	21.16± 1.69	169.69± 14.30
Wuchin	31.59± 1.78	34.79± 2.23	45.64± 1.26	144.48± 9.04
Average by localities	*25.36*	*21.19*	*61.01*	*160.65*
Average by 17 localities	*11.86*	*7.09*	*44.81*	*228.20*

locality having the largest proportion is Hwaiyuan Hsien, Anhwei, where nearly three-fourths of the farm operators have such income. Pingsiang Hsien, Chihli, shows the lowest proportion of nearly one-fourth.

Twelve of the localities have not quite one-fourth of all farmers with an occupation other than farming. Twice as large a percentage of the farmers in the small size-group of farms have such occupations compared with those on the farms in the large size-group (table 49). This relationship to a varying degree also holds true for all the localities except

TABLE 48. AMOUNT AND DISTRIBUTION OF INCOME FROM SOURCES OTHER THAN THE FARM

2209 farms, 12 localities, five provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	PER CENT OF INCOME FROM THE FOLLOWING SOURCES											
	Per cent of farm families having income from other than farm sources	Renting land	Home industry	Labor		Professional work	Trading	Interest	Sent by absent family members	Other	Average income	
				Unskilled	Skilled						For those having	For all families
North China												
Anhwei												
Hwaiyuan	73.4	6.1	...	...	11.6	15.7	14.4	12.1	33.9	6.2	$41.33	$30.33
Su	59.1	33.8	10.4	9.1	6.1	5.9	22.2	5.8	4.8	1.9	76.96	45.47
Chihli												
Pingsiang	21.1	2.7	...	...	8.0	1.9	34.7	...	52.7	...	54.99	11.58
Yenshan (1922)	24.0	...	6.2	3.0	13.1	14.3	...	14.9	48.1	0.4	63.89	15.33
Yenshan (1923)	57.9	...	2.8	1.1	...	0.4	4.3	2.4	70.2	18.8	29.65	17.17
Honan												
Sincheng	47.9	0.4	...	0.5	7.1	5.5	60.8	...	24.6	1.1	69.96	33.52
Kaifeng	30.9	...	...	...	23.5	14.0	44.0	...	18.5	...	24.87	7.68
Shansi												
Wusiang	68.1	22.2	0.2	...	9.1	20.1	19.2	1.8	26.5	0.9	51.99	35.42
East Central China												
Anhwei												
Laian (1922)	30.0	36.1	...	...	...	...	...	...	...	63.9	274.20	82.26
Kiangsu												
Kiangning (S)	43.8	11.2	...	...	3.3	0.3	1.8	...	83.4	...	137.86	60.44
Kiangning (T)	34.1	39.6	14.8	...	2.9	28.8	4.9	1.0	6.9	1.1	66.57	22.70
Wuchin	64.0	7.0	...	0.1	4.3	11.7	8.4	36.0	11.7	20.8	73.56	47.08
Average by 12 localities	*48.7*	*13.2*	*2.9*	*1.1*	*7.4*	*9.9*	*17.9*	*6.2*	*31.8*	*9.6*	*80.49*	*34.08*

Pingsiang Hsien, Chihli. It is to be expected that such a relationship would exist because of the need for additional work by operators having small farms. However, there is little relationship between size of farm and supplementary income per adult-male unit (table 13, chapter IV).

The sources of these incomes show that nearly one-third are from money sent by members of the family working elsewhere, one-fifth from trading, one-eighth from renting of land, and one-tenth from professional work (table 48).

The average amount of income from other than farm sources is $34 for all families, and varies from $7.68 for Kaifeng Hsien, Honan, to $82.26 for Laian Hsien (1922), Anhwei (table 48). Such income is approximately twelve per cent of the total family earnings. For families having such income it averages $80 and the highest is $274 for Laian (1922), Anhwei, where 36 per cent of it is for renting land to

TABLE 49. RELATION OF SIZE OF FARM TO OPERATORS HAVING AN OCCUPATION IN ADDITION TO FARMING

2109 farm families, 11 localities, five provinces, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	PERCENTAGE OF OPERATORS TO TOTAL NUMBER OF OPERATORS HAVING AN OCCUPATION IN ADDITION TO FARMING FOR FARMS GROUPED BY SIZE					
	Small	Medium small	Medium	Medium large	Large	Average
North China						
Anhwei						
Hwaiyuan	45.9	44.8	18.8	22.7	25.0	34.7
Su	57.1	...	42.0	...	23.7	41.6
Chihli						
Pingsiang	10.4	...	20.0	...	13.0	14.5
Yenshan (1922)	39.4	25.0	...	11.8	17.1	23.8
Yenshan (1923)	17.8	...	8.9	...	4.7	10.5
Honan						
Sincheng	38.5	32.1	...	27.6	35.0	33.3
Kaifeng	41.7	7.5	...	2.9	0.0	10.1
Shansi						
Wusiang	51.4	32.9	20.8	22.2	41.7	33.1
East Central China						
Kiangsu						
Kiangning (S)	28.6	9.3	...	6.1	8.6	12.3
Kiangning (T)	38.2	13.3	15.1	7.0	2.4	14.3
Wuchin	58.4	19.1	17.6	19.4	27.8	31.0
Average by 11 localities	*38.9*	...	*20.3*	...	*19.9*	*23.6*

others. It is well-known that many members of the villages studied in Kiangning (S) are absent and are engaged in trading in the big cities along the Yangtze from Shanghai to Hankow. Eighty-three per cent of other income is from these absent members and it averages $138 per family for the 43.8 per cent of families having such income. The three localities studied in Chihli also have a predominant part of the income from other than farm sources from the absent members who go to Manchuria to work during the growing season or who settle there. Trading makes up 61 per cent of the other income for Sincheng Hsien, Honan, and 44 per cent for Kaifeng Hsien, Honan.

The relation of size of farm to the proportion of operators engaged in other occupations and to the amount of income from such occupations is discussed in the next chapter.

Briefly stated, this study reveals from all standpoints that the year's farm business is a small one, and profits are therefore correspondingly low. Such profits naturally determine to a marked degree the quality of living resulting from this small scale business, typical of millions of farmers in China.

LITERATURE CITED

(1) United States Department of Agriculture Year Book 1922, p. 1002.

CHAPTER IV

THE BEST SIZE OF FARM BUSINESS

A study of the relation of different sizes of farm business to various factors has been made to determine which sizes are the best from the standpoint of maximum profits. For this purpose farms have been sorted into three, four, and five different size-groups, and the values of factors measuring profits, labor efficiency, and quality of business, as well as other factors such as receipts per mow, expenses per mow, and interest on capital investment, have been determined for each size-group. Farms have also been sorted by other size of business factors, such as man-work units and amount of capital.

Uniform class intervals for size of farm have not been used because the number of farms in many cases would be too small to make the values in a given interval of significance. The size of each class interval in local mow for each locality and the number of farms in each class interval is given in table 1. The limits of each class interval in terms of hectares is shown in table 2 and the average size of the farms for each interval is shown in table 3. From this grouping it is seen that farms in the large size-group are approximately six times the size of those in the small size-group. In North China the difference is 6.6 times greater, while in East Central China it is only 4.8 times greater.

Smaller class limits might have been taken, but such grouping would have left numerous class intervals with very few farms in each interval. Since a few observations might be unrepresentative, it has seemed best to use the broader classification. As a check upon the method used a narrower classification was made, and the factors of operator's labor earnings, family earnings per adult-male unit, and crop mow per man-equivalent were determined for such smaller size-groups. Class intervals having less than twenty items, however, were omitted. This excluded many of the larger size farms and hence tends to lessen the difference between the

smallest and the largest size-groups for the various values of profits and efficiency factors. Otherwise the conclusions to be drawn are the same as those from the wider class limits and for this reason the results of this other classification are not published.

For the small, medium small, medium, medium large, and large size-groups of farm area two types of tabulation have been used; one shows the averages for each locality in a single table for a given variable, the tables being included in this chapter, and the other shows all variables for each locality in a single table (appendix I, tables 1-18). These are especially useful

TABLE 1. CLASS SIZES OF FARMS GROUPED BY SIZE OF FARM AREA AND NUMBER OF FARMS IN EACH CLASS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Class sizes (in local mow)					Number of farms in each class					
	Small	Medium small	Medium	Medium large	Large	Small	Med. small	Medium	Med. large	Large	Total
North China											
Anhwei											
Hwaiyuan	0–19.9	20–39.9	40–59.9	60–79.9	80 and over	37	29	16	22	20	124
Su	0–25.0	...	26–70.0	...	71 „ „	105	...	88	...	93	286
Chihli											
Pingsiang	0–10.0	...	11–20.0	...	21 „ „	48	...	50	...	54	152
Yenshan (1922)	0–10.0	11–20.0	...	21–30.0	31 „ „	33	48	...	34	35	150
Yenshan (1923)	0–25.0	...	26–50.0	...	51 „ „	45	...	45	...	43	133
Honan											
Sincheng	0–24.9	25–49.9	...	50–74.9	75 „ „	39	56	...	29	20	144
Kaifeng	0–24.9	25–49.9	...	50–74.9	75 „ „	24	53	...	35	37	149
Shansi											
Wusiang	0–10.0	11–20.0	21–30.0	31–40.0	41 „ „	35	79	53	36	48	251
Wutai	0–60.0	61–140.0	141–170.0	171–200.0	201 „ „	42	67	40	40	37	226
Total	...	...	...	...	...	*408*	*332*	*292*	*196*	*337*	*1615*
East Central China											
Anhwei											
Laian (1921)	0–50.0	51–70.0	...	71–90.0	91 „ „	22	28	...	24	27	101
Laian (1922)	0–30.0	...	31–50.0	...	51 „ „	31	...	39	...	30	100
Wuhu	0–10.0	11–20.0	...	21–30.0	31 „ „	14	51	...	17	20	102
Chekiang											
Chinhai	0–14.0	...	15–20.0	...	21 „ „	23	...	23	...	21	67
Fukien											
Lienkiang	0–10.0	...	11–20.0	...	21 „ „	56	...	55	...	50	161
Kiangsu											
Kiangning (S)	0–15.0	16–25.0	...	26–35.0	36 „ „	42	54	...	49	58	203
Kiangning (T)	0–19.9	20–29.9	30–39.9	40–49.9	50 „ „	34	45	53	43	42	217
Wuchin	0–9.9	10–19.9	20–29.9	30–39.9	40 „ „	89	94	68	31	18	300
Total	...	...	...	...	...	*311*	*272*	*238*	*164*	*266*	*1251*
Total by 17 localities	...	...	...	...	...	*719*	*604*	*530*	*360*	*653*	*2866*

for studying individually a single locality. Table 18 (appendix I) gives the average of each variable for all localities.

In comparing the effect of the size of business upon various factors, the ratio of the values in the larger size-groups to the small size-group taken as 100 have been determined in order to facilitate the interpretation of the differences between the various groups.

A more refined statistical method measures such association in terms of the gross correlation coefficient. Thirty-four of these coefficients have been calculated for important variables for each of the seventeen localities (appendix II, tables 1-7).

TABLE 2. CLASS SIZES AND THE MEDIAN NUMBER OF HECTARES IN EACH GROUP OF FARMS BY SIZE OF FARM AREA (HECTARES)

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Class sizes of farm area in hectares					Median number of hectares for the specified size-groups					
	Small	Medium small	Medium	Medium large	Large	Small	Medium small	Medium	Medium large	Large	All farms
North China											
Anhwei											
Hwaiyuan	0–1.6	1.7–3.2	3.3–4.8	4.9–6.4	6.5 and over	1.04	2.24	3.75	5.19	8.83	2.64
Su	0–2.0	...	2.1–5.5	...	5.6 „ „	0.87	...	3.32	...	9.48	3.16
Chihli											
Pingsiang	0–0.6	...	0.7–1.1	...	1.2 „ „	0.41	...	0.85	...	1.70	0.87
Yenshan (1922)	0–0.8	0.9–1.6	...	1.7–2.4	2.5 „ „	0.65	1.21	..	1.94	3.35	1.53
Yenshan (1923)	0–2.0	...	2.1–4.0	...	4.1 „ „	1.21	...	2.95	...	5.89	2.91
Honan											
Sincheng	0–1.7	1.8–3.4	...	3.5–5.1	5.2 „ „	1.39	2.12	...	3.84	6.63	2.44
Kaifeng	0–1.4	1.5–2.8	...	2.9–4.2	4.3 „ „	0.99	1.97	...	3.48	6.38	2.79
Shansi											
Wusiang	0–0.6	0.7–1.3	1.4–1.9	2.0–2.6	2.7 „ „	0.52	0.98	1.63	2.38	3.51	1.50
Wutai	0–3.7	3.8–8.7	8.8–10.6	10.7–12.5	12.6 „ „	3.17	4.47	9.50	11.31	14.71	8.80
Median by localities	...	...	...	...	...	*0.99*	*2.50*	*3.14*	*3.66*	*6.38*	*2.64*
East Central China											
Anhwei											
Laian (1921)	0–2.8	2.9–3.9	...	4.0–5.0	5.0 „ „	1.71	3.39	...	4.47	6.57	3.92
Laian (1922)	0–1.7	...	1.8–2.8	...	2.9 „ „	0.88	...	2.26	...	3.86	2.26
Wuhu	0–0.6	0.7–1.3	...	1.4–2.0	2.1 „ „	0.54	1.08	...	1.62	3.37	1.21
Chekiang											
Chinhai	0–0.8	...	0.9–1.3	...	1.4 „ „	0.75	...	1.00	...	1.94	1.00
Fukien											
Lienkiang	0–0.4	...	0.5–0.9	...	1.0 „ „	0.31	...	0.64	...	1.37	0.60
Kiangsu											
Kiangning (S)	0–1.1	1.2–1.8	...	1.9–2.5	2.6 „ „	0.89	1.49	...	2.24	3.24	1.94
Kiangning (T)	0–1.2	1.3–1.8	1.9–2.4	2.5–3.0	3.1 „ „	0.85	1.52	2.07	2.74	3.44	2.13
Wuchin	0–0.7	0.8–1.4	1.5–2.1	2.2–2.8	2.9 „ „	0.50	1.08	1.69	2.52	3.23	1.15
Median by localities	...	...	...	...	...	*0.80*	*1.49*	*1.69*	*2.25*	*3.31*	*1.58*
Median by 17 localities	...	...	...	...	...	*0.87*	*1.25*	*2.07*	*2.74*	*3.15*	*2.13*

Medians were obtained for most of the variables relating to each size-group of farms, but these are not published because in general differences are of the same nature for all data. For the most part, the average as expressed by the median is smaller than that expressed by the mean for variables pertaining to size of business and to profits. This is caused by the extreme values of the few large farms. These extreme values raise the mean and make it a less reliable number for measuring averages than the median. Variables such as crop index, crop mow per man, index of double cropping, and land values, do not have these extreme differences and therefore the mean is quite

TABLE 3. AVERAGE FARM AREA IN HECTARES FOR EACH SIZE-GROUP OF FARMS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Farm area per farm for farms grouped by size						Ratios of farm area per farm for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	0.91	2.20	3.83	5.36	8.99	3.68	100	242	421	589	988
Su	1.01	...	3.40	...	10.48	4.83	100	...	337	...	1038
Chihli											
Pingsiang	0.41	...	0.89	...	2.03	1.14	100	...	217	...	495
Yenshan (1922)	0.61	1.26	...	1.99	4.24	1.98	100	207	...	326	695
Yenshan (1923)	1.08	...	3.02	...	7.08	3.68	100	...	280	...	656
Honan											
Sincheng	1.28	2.33	...	3.91	7.39	3.07	100	182	...	305	577
Kaifeng	0.97	2.04	...	3.49	6.54	3.33	100	210	...	360	674
Shansi											
Wusiang	0.52	0.99	1.65	2.32	4.11	1.85	100	190	317	446	790
Wutai	3.12	5.41	9.60	11.27	14.82	8.30	100	173	308	361	475
Average by localities	*1.10*	...	*3.07**	...	*7.30*	*3.54*	*100*	...	*279*	...	*664*
East Central China											
Anhwei											
Laian (1921)	1.75	3.40	...	4.41	6.47	4.11	100	194	...	252	370
Laian (1922)	0.92	...	2.24	...	4.60	2.54	100	...	243	...	500
Wuhu	0.53	1.07	...	1.69	4.03	1.68	100	202	...	319	760
Chekiang											
Chinhai	0.76	...	1.05	...	2.19	1.30	100	...	138	...	288
Shansi											
Lienkiang	0.31	...	0.66	...	2.18	1.01	100	...	213	...	703
Kiangsu											
Kiangning (S)	0.89	1.48	...	2.21	3.87	2.21	100	166	...	248	435
Kiangning (T)	0.85	1.46	2.09	2.72	3.82	2.23	100	172	246	320	449
Wuchin	0.47	1.04	1.70	2.47	3.45	1.82	100	221	362	526	734
Average by localities	*0.80*	...	*1.81**	...	*3.33*	*2.05*	*100*	...	*226*	...	*479*
Average by 17 localities	*0.96*	...	*2.47**	...	*5.66*	*2.84*	*100*	...	*257*	...	*590*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

reliable as a form of average. In the case of size of farm as measured by farm area, crop area, crop mow, and man-work units, invariably the median is lower than the mean. For the small size-groups, the median and the mean are almost the same, but for the large size-group of farms, the median is usually very much lower than the mean. This is because there are more extreme values in the large size-group than in the small size-group. In the case of profits the difference between the mean and median for the different measures of profits is not at all uniform, but where differences do occur the median usually gives lower values.

THE SIZE OF FARM BUSINESS IN RELATION TO PROFITS

In general, profits increase with the size of the farm business. Exceptions are years of crop failures evidenced by the data presented for Yenshan Hsien (1923), Chihli, a year in which the wheat crop was a failure. Here losses also increase with the size of farm. The reason for this is that larger farms have greater expenses, and if the crops fail equally with those on the small farms, then the large farms are left with a larger amount of expenses which are not in any way covered by receipts.

Size of Farm and Measures of Profits

Farm earnings.—Farm earnings are one of the best measures of the relationship between size of farm and profits. They are not affected by the non-cash charge for interest on capital investment which, in some cases, may be high because of valuations on land that are higher than farm values, or because of variation in size and construction of farm buildings, which in turn affect value. In such instances the amount of interest may determine to some degree the relationship between size of farm and profits when, as a matter of fact, it is of little importance from the standpoint of the actual income on the farm.

The farm earnings for the seventeen localities amount to $106 for farms in the small size-group compared with $439 in the large size-group (table 4). For six localities they are five to six and one-half times greater, for seven localities three to five times greater, and for three localities two to three times greater. The exceptional difference of over twenty times for

Hwaiyuan Hsien, Anhwei, is caused by the farm earnings in the small size-group being so small a number, and for this reason it should not be given undue weight.

In North China localities the difference is 5.4 times greater, and in East Central China localities 3.5 times greater. Such a difference between the two regions is largely accounted for by the 6.6 times greater size of farms, as expressed by crop hectare area, in North China, compared with the 4.3 times greater size in East Central China (table 4, chapter III).

TABLE 4. RELATION OF SIZE OF FARM TO FARM EARNINGS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FARM EARNINGS PER FARM FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF FARM EARNINGS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium Small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China	$	$	$	$	$	$					
Anhwei											
Hwaiyuan	9.18	39.89	82.07	133.81	205.04	79.47	100	435	894	1458	2234
Su	61.09	...	214.26	...	395.14	216.84	100	...	351	...	647
Chihli											
Pingsiang	53.77	...	83.78	...	162.39	102.23	100	...	156	...	302
Yenshan (1922)	46.63	78.72	...	103.73	178.76	100.67	100	169	...	222	383
Yenshan (1923)	21.70	...	53.87	...	113.65	62.31	100	...	248	...	524
Honan											
Sincheng	117.74	200.54	...	304.89	703.77	269.03	100	170	...	259	598
Kaifeng	139.66	253.23	...	390.18	629.41	360.52	100	181	...	279	451
Shansi											
Wusiang	41.80	75.44	107.55	157.40	228.19	118.49	100	180	257	377	546
Wutai	157.37	295.58	551.81	587.66	852.26	458.11	100	188	351	373	542
Average by localities	*72.10*	...	*179.28**	...	*385.40*	*196.41*	*100*	...	*249*	...	*535*
East Central China											
Anhwei											
Laian (1921)	171.53	317.65	...	417.24	542.49	369.59	100	185	...	243	316
Laian (1922)	59.45	...	118.06	...	230.67	133.67	100	...	199	...	388
Wuhu	107.19	168.55	...	266.63	624.05	265.79	100	157	...	249	582
Chekiang											
Chinhai	184.74	...	245.52	...	425.29	281.00	100	...	133	...	230
Fukien											
Lienkiang	181.91	...	376.72	...	896.33	470.33	100	...	207	...	493
Kiangsu											
Kiangning (S)	266.09	315.56	...	413.68	668.90	429.97	100	119	...	155	251
Kiangning (T)	79.81	110.96	131.50	184.87	225.95	148.00	100	139	165	232	283
Wuchin	100.80	190.98	268.62	330.19	374.43	207.18	100	190	266	328	371
Average by localities	*143.94*	...	*255.14**	...	*498.51*	*288.19*	*100*	...	*177*	...	*346*
Average by 17 localities	*105.91*	...	*214.98**	...	*438.63*	*239.60*	*100*	...	*203*	...	*414*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

From these data it may be concluded that farm earnings without exception increase significantly with each succeeding size-group of farms. In fact, only two localities show a tendency toward constant or diminishing returns.

Operator's labor earnings.—The operator's labor earnings, which are usually the best business measure of the operator's farming ability, are $51 in the small size-group of farms compared with $140 in the large size-group (table 5). They are

TABLE 5. RELATION OF SIZE OF FARM TO OPERATOR'S LABOR EARNINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	OPERATOR'S LABOR EARNINGS FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF OPERATOR'S LABOR EARNINGS FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei	$	$	$	$	$	$					
Hwaiyuan	-14.89	-9.36	-2.77	23.00	-0.01	-2.91	...	...	...	...	...
Su	23.37	...	93.84	...	110.42	73.36	100	...	402	...	472
Chihli											
Pingsiang	22.39	...	26.66	...	32.50	27.39	100	...	119	...	145
Yenshan (1922)	23.07	38.03	...	38.72	58.54	39.68	100	165	...	168	254
Yenshan (1923)	-11.12	...	-45.85	...	-136.73	-63.48	...	...	...	...	...
Honan											
Sincheng	43.08	66.80	...	77.75	271.69	91.04	100	155	...	180	631
Kaifeng	81.76	137.19	...	194.31	269.57	174.55	100	168	...	238	330
Shansi											
Wusiang	23.58	41.86	51.27	77.17	67.65	51.29	100	178	217	327	287
Wutai	77.21	112.03	91.66	96.90	168.08	108.45	100	145	119	126	218
Average by localities	*29.83*	...	*55.67**	...	*93.52*	*55.49*	*100*	...	*187*	...	*314*
East Central China											
Anhwei											
Laian (1921)	65.07	125.79	...	159.95	168.16	132.01	100	193	...	246	258
Laian (1922)	7.55	...	-3.49	...	63.21	19.94	100	...	...	...	837
Wuhu	32.17	38.40	...	15.93	149.35	55.56	100	119	...	50	464
Chekiang											
Chinhai	104.12	...	127.85	...	176.10	134.83	100	...	123	...	169
Fukien											
Lienkiang	116.21	...	204.44	...	478.15	258.75	100	...	176	...	411
Kiangsu											
Kiangning (S)	189.84	198.26	...	242.74	368.01	255.75	100	104	...	128	194
Kiangning (T)	35.07	46.81	41.71	53.93	26.82	41.27	100	133	119	154	76
Wuchin	56.61	92.16	111.42	110.31	104.27	88.61	100	163	197	195	184
Average by localities	*75.83*	...	*103.94**	...	*191.76*	*123.34*	*100*	...	*144*	...	*253*
Average by 17 localities	*51.48*	...	*80.73**	...	*139.75*	*87.42*	*100*	...	*157*	...	*271*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

three times greater for the large size-group in North China compared with two and one-half times greater in East Central China. This relationship is also shown by the degree of association between crop hectare area and operator's labor earnings. The gross correlation coefficients are low for six localities, moderate for four, marked for three, and high for two and very close for one locality. The only locality having a high negative association is Yenshan Hsien (1923), Chihli, and this is because of crop failures. The extreme variation in these coefficients, from $-.819 \pm .019$ to $+.904 \pm .01$ is largely influenced by the crop year. The average of the coefficients for the fifteen localities is +.433 (appendix II, table 1 and 3). From a strictly business standpoint, where all charges are made, even including interest on investment, it is still evident that the farms in the large size-group are the most profitable.

Size of farm and farm labor earnings per farm.—For the seventeen localities the average farm labor earnings on farms in the small size-group are $51, while in the large size-group they are $162, or over three times as great (table 6). Five localities have farm labor earnings four to eight times greater, of which three are over seven times greater, while in eight localities they are one and one-half but not more than four times greater.

Such farm labor earnings do not increase as much with the increase in the size of farm as do farm earnings, because interest on capital investment is nearly the same per unit of land in all size-groups of farms. Consequently the larger farms have a greater amount of interest charges per farm and this cuts down the same proportional increase in farm labor earnings as do farm earnings. For North China the relationship is 4.6 times greater while for East Central China it is 2.6 times greater. Here as in farm earnings the difference in North China is caused chiefly by the larger size of farm in the large size-group in North China as compared with that of East Central China (table 4, chapter III).

Size of farm and family earnings.—Family earnings are one of the best measures of the profits of the farm family. In making a comparison of amount of such earnings for the different size-groups of farms, the value of rent on the farm residence has not

TABLE 6. RELATION OF SIZE OF FARM TO FARM LABOR EARNINGS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FARM LABOR EARNINGS PER FARM FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF FARM LABOR EARNINGS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Small medium	Medium	Large medium	Large	Average for all farms	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei	$	$	$	$	$	$					
Hwaiyuan	-14.85	-9.42	-4.98	23.48	-0.08	-3.12	...	...	...	...	...
Su	23.61	...	94.94	...	99.80	70.33	100	...	402	...	423
Chihli											
Pingsiang	21.89	...	25.85	...	32.45	26.94	100	...	118	...	148
Yenshan (1922)	23.07	38.03	...	38.72	58.54	39.68	100	165	...	168	254
Yenshan (1923)	-11.42	...	-46.76	...	-137.55	-64.16	...	...	...	...	...
Honan											
Sincheng	38.82	63.31	...	72.38	275.41	87.97	100	163	...	186	709
Kaifeng	81.76	137.13	...	195.28	270.66	175.03	100	168	...	239	331
Shansi											
Wusiang	23.24	41.62	50.92	75.39	65.10	50.36	100	179	219	324	280
Wutai	77.21	171.13	336.86	356.23	548.31	277.52	100	222	436	461	710
Average by localities	*29.26*	...	*73.30**	...	*134.74*	*73.39*	*100*	...	*251*	...	*460*
East Central China											
Anhwei											
Laian (1921)	83.20	169.04	...	227.45	271.04	191.49	100	203	...	273	326
Laian (1922)	4.77	...	-4.65	...	36.49	10.61	100	...	...	...	765
Wuhu	23.59	10.32	...	-11.57	51.66	16.60	100	...	...	...	219
Chekiang											
Chinhai	107.09	...	133.77	...	173.74	137.14	100	...	125	...	162
Fukien											
Lienkiang	120.81	...	232.17	...	532.29	286.68	100	...	192	...	441
Kiangsu											
Kiangning (S)	188.17	194.25	...	240.00	365.90	253.08	100	103	...	128	194
Kiangning (T)	19.60	20.23	17.61	28.65	9.56	19.09	100	103	90	146	49
Wuchin	57.22	94.47	116.61	118.54	108.10	91.74	100	165	204	207	189
Average by localities	*75.56*	...	*113.25**	...	*193.60*	*125.80*	*100*	...	*150*	...	*256*
Average by 17 localities	*51.05*	...	*92.11**	...	*162.44*	*98.06*	*100*	...	*180*	...	*318*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

been included. Family earnings average $146 in the small size-group as compared with $484 in the large size-group (table 7). In five localities they are four times greater and in eleven localities they are between two and four times greater. The relationship is nearly the same for both North and East Central China.

Size of farm and family earnings per adult-male unit.—One of the best comparisons of profits on small and large farms is

TABLE 7. RELATION OF SIZE OF FARM TO FAMILY EARNINGS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FAMILY EARNINGS PER FARM FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF FAMILY EARNINGS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average for all farms	Small	Medium small	Medium	Medium large	Large
North China											
	$	$	$	$	$	$					
Anhwei											
Hwaiyuan	76.26	102.28	158.04	209.55	376.49	164.97	100	134	207	275	494
Su	104.82	...	253.82	...	410.95	250.21	100	...	242	...	392
Chihli											
Pingsiang	62.61	...	103.95	...	207.98	127.86	100	...	166	...	332
Yenshan (1922)	77.70	98.96	...	133.40	240.61	135.14	100	127	...	172	310
Yenshan (1923)	48.82	...	110.82	...	184.83	113.77	100	...	227	...	379
Honan											
Sincheng	176.23	290.40	...	416.11	689.66	340.24	100	165	...	236	391
Kaifeng	184.20	289.45	...	426.73	643.90	392.76	100	157	...	232	350
Shansi											
Wusiang	66.74	97.52	140.73	185.86	301.93	154.12	100	146	211	278	452
Wutai	207.48	236.85	144.23	147.57	225.55	197.20	100	114	70	71	109
Average by localities	*111.65*	...	*191.94**	...	*364.66*	*208.47*	*100*	...	*172*	...	*327*
East Central China											
Anhwei											
Laian (1921)	274.23	405.77	...	468.23	597.06	443.09	100	148	...	171	218
Laian (1922)	181.07	...	383.64	...	488.97	352.44	100	...	212	...	270
Wuhu	134.21	239.55	...	345.94	834.02	359.38	100	178	...	258	621
Chekiang											
Chinhai	147.04	...	186.73	...	328.02	217.39	100	...	127	...	223
Fukien											
Lienkiang	198.09	...	368.86	...	922.67	481.45	100	...	186	...	466
Kiangsu											
Kiangning (S)	292.37	318.09	...	454.37	834.37	493.17	100	109	...	155	285
Kiangning (T)	141.15	176.56	209.92	296.39	444.18	254.70	100	125	149	210	315
Wuchin	113.37	212.20	347.84	459.71	495.58	256.20	100	187	307	405	437
Average by localities	*185.19*	...	*318.54**	...	*618.11*	*357.23*	*100*	...	*172*	...	*334*
Average by 17 localities	*146.26*	...	*251.51**	...	*483.93*	*273.48*	*100*	...	*172*	...	*331*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

that of family earnings per adult-male unit, which takes into account the size of the family. Such earnings vary from $45 in the small size-group of farms to $86 in the large size-group, a difference of 89 per cent (table 8). Six localities have between two and three times greater family earnings per adult-male unit in the large size-group, while all other localities have between one and two times greater earnings.

From these data it is quite evident that a person living on a large farm is economically much better off than one on a small farm.

TABLE 8. RELATION OF SIZE OF FARM TO FAMILY EARNINGS PER ADULT-MALE UNIT

2640 farms, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FAMILY EARNINGS PER ADULT-MALE UNIT FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF FAMILY EARNINGS PER ADULT-MALE UNIT FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$29.15	$28.99	$37.68	$49.31	$57.83	$41.76	100	99	129	169	198
Su	30.45	...	48.56	...	58.39	48.48	100	...	159	...	192
Chihli											
Pingsiang	26.16	...	33.45	...	46.56	37.71	100	...	128	...	178
Yenshan (1922)	34.19	28.02	...	30.98	38.70	33.31	100	82	...	91	113
Yenshan (1923)	21.31	...	27.89	...	33.81	29.27	100	...	131	...	159
Honan											
Sincheng	44.00	59.16	...	61.98	94.15	63.44	100	134	...	141	214
Kaifeng	43.17	58.26	...	68.39	88.07	68.48	100	135	...	158	204
Shansi											
Wusiang	24.62	36.51	36.17	46.89	70.77	44.99	100	148	147	190	287
Average by localities	*31.63*	...	*42.49**	...	*61.04*	*45.93*	*100*	...	*134*	...	*193*
East Central China											
Anhwei											
(1921)	87.95	96.94	...	103.10	109.59	101.27	100	110	...	117	125
Laian (1922)	53.92	...	88.32	...	83.63	78.51	100	...	164	...	155
Wuhu	47.57	65.44	...	82.60	120.96	84.21	100	138	...	174	254
Chekiang											
Chinhai	48.45	...	46.68	...	75.04	57.43	100	...	96	...	155
Fukien											
Lienkiang	66.50	...	92.80	...	184.31	121.95	100	...	140	...	277
Kiangsu											
Kiangning (S)	83.25	88.59	...	104.87	154.61	115.51	100	106	...	126	186
Kiangning (T)	45.32	46.44	48.14	54.98	62.50	53.23	100	102	106	121	138
Wuchin	40.09	59.23	80.18	100.57	94.70	68.66	100	148	200	251	236
Average by localities	*59.13*	...	*77.50**	...	*110.67*	*85.10*	*100*	...	*131*	...	*187*
Average by 16 localities	*45.38*	...	*59.99**	...	*85.85*	*65.51*	*100*	...	*132*	...	*189*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

Size of farm and labor returns per farm.—Labor returns per farm are $91 for the small size-group, $163 for the medium size-group, and $318 for the large size-group (table 9). Such returns are higher in the large size-group in all localities.

Size of farm and labor returns per man-equivalent.—Labor returns are the earnings from all labor performed on the farm. They are computed in the same way as labor earnings except

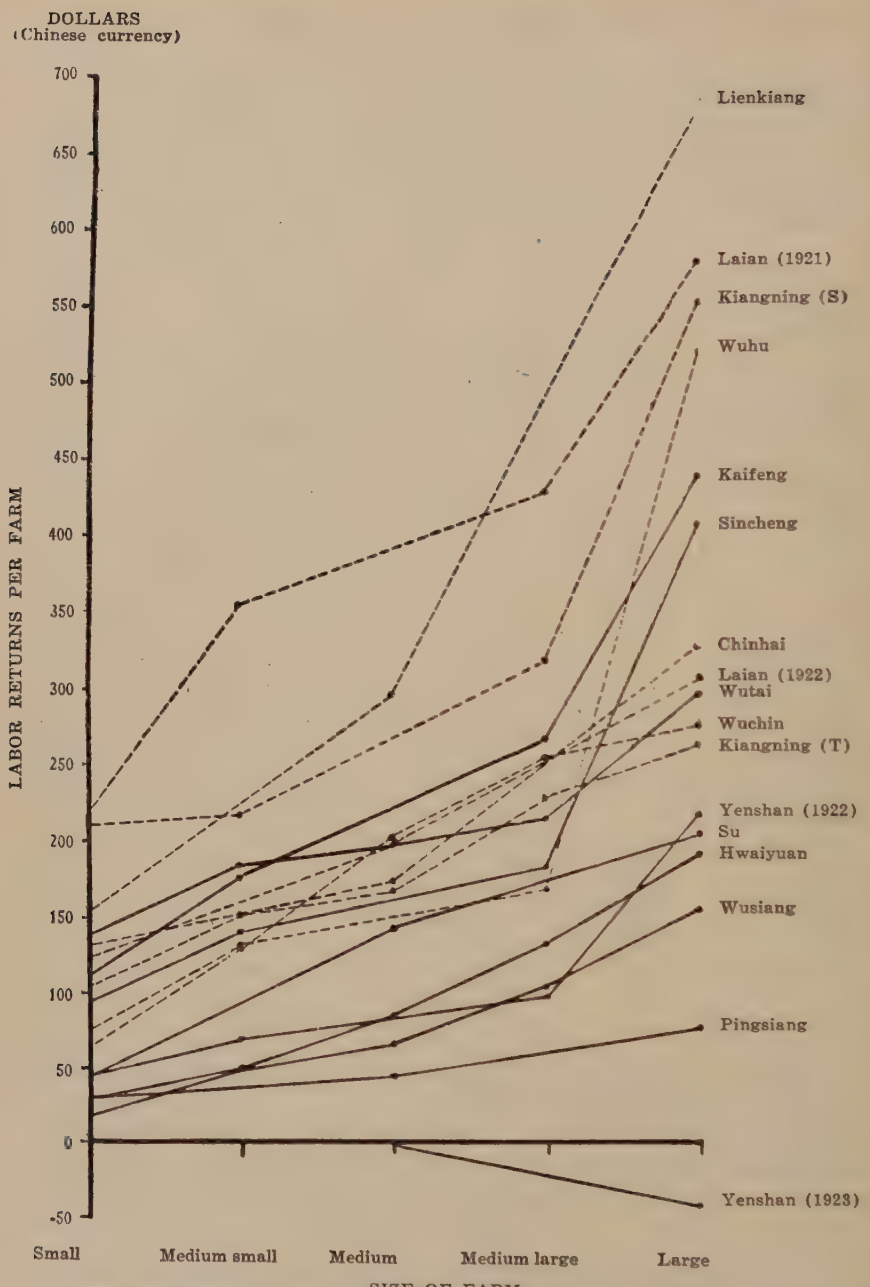

Fig. 1. Relation of size of farm to labor returns per farm. 2866 farms, 17 localities, seven provinces, China (1921-1925).

TABLE 9. RELATION OF SIZE OF FARM TO LABOR RETURNS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	LABOR RETURNS PER FARM FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF LABOR RETURNS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China	$	$	$	$	$	$					
Anhwei											
Hwaiyuan	17.46	48.78	83.89	130.64	188.14	80.97	100	279	480	748	1078
Su	40.80	...	142.53	...	202.41	124.65	100	...	349	...	496
Chihli											
Pingsiang	28.99	...	43.60	...	74.95	50.12	100	...	150	...	259
Yenshan (1922)	39.42	67.98	...	95.80	214.97	102.30	100	172	...	243	545
Yenshan (1923)	−0.68	...	−3.11	...	−42.41	−15.00	...	...	...	...	...
Honan											
Sincheng	90.72	137.34	...	181.43	403.67	170.58	100	151	...	200	445
Kaifeng	107.65	172.23	...	271.09	434.96	250.29	100	160	...	252	404
Shansi											
Wusiang	26.98	47.50	66.34	102.46	152.43	76.57	100	176	246	380	565
Wutai	135.45	181.59	193.06	209.38	293.00	198.20	100	134	143	155	216
Average by localities	*54.09*	...	*107.56**	...	*218.57*	*115.41*	*100*	...	*199*	...	*395*
East Central China											
Anhwei											
Laian (1921)	218.16	352.54	...	425.20	574.50	399.87	100	162	...	195	263
Laian (1922)	122.07	...	195.11	...	303.98	205.13	100	...	160	...	249
Wuhu	71.46	129.95	...	166.40	517.12	203.92	100	182	...	233	724
Chekiang											
Chinhai	128.11	...	173.41	...	325.70	205.59	100	...	135	...	254
Fukien											
Lienkiang	151.57	...	293.21	...	680.69	364.28	100	...	193	...	449
Kiangsu											
Kiangning (S)	209.66	216.63	...	316.08	547.83	333.82	100	103	...	151	261
Kiangning (T)	100.91	147.08	165.48	227.42	259.83	182.08	100	146	164	225	257
Wuchin	60.12	126.51	197.53	251.55	273.33	144.64	100	210	329	418	455
Average by localities	*132.76*	...	*225.12**	...	*435.37*	*254.92*	*100*	...	*170*	...	*328*
Average by 17 localities	*91.11*	...	*162.88**	...	*317.95*	*181.06*	*100*	...	*179*	...	*349*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

that no labor charge is made. Labor returns amount to $70 per man-equivalent on farms in the small size-group, and to $97 per man-equivalent on farms in the large size-group (table 10). Four localities show labor returns between two and three and one-half times greater in the large size-group, while in nine localities such returns are over one but less than two times greater. Four localities showed smaller returns per man-equivalent on the larger farms than on the smaller ones. In Yenshan Hsien (1923), Chihli, the relationship is a loss which

increases with the size of farm because of crop failure. The difference in returns in favor of large farms for most localities makes it advisable for a farmer to work on such farms rather than on small ones, and a farmer on a large farm is again more fortunate than one on a small farm, because annual returns for his labor are greater. Since labor returns per man-equivalent measure the welfare of the total agricultural labor, it may also be concluded that from the point of view of society as a whole, the farms in the large size-group are the most desirable.

TABLE 10. RELATION OF SIZE OF FARM TO LABOR RETURNS PER MAN-EQUIVALENT

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	LABOR RETURNS PER MAN-EQUIVALENT FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF LABOR RETURNS PER MAN-EQUIVALENT FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$15.76	$28.02	$36.90	$52.18	$53.57	$33.92	100	178	234	331	340
Su	60.83	...	101.26	...	74.96	77.86	100	...	166	...	123
Chihli											
Pingsiang	27.61	...	38.23	...	45.29	37.38	100	...	138	...	164
Yenshan (1922)	50.06	57.29	...	70.68	87.27	65|73	100	114	...	141	174
Yenshan (1923)	−0.88	...	2.39	...	−12.03	−5.00	...	...	...	...	...
Honan											
Sincheng	37.41	47.42	...	44.41	89.71	49.98	100	127	...	119	240
Kaifeng	83.17	99.71	...	104.43	113.49	101.58	100	120	...	126	136
Shansi											
Wusiang	40.05	54.80	59.18	85.44	80.32	62.94	100	137	148	213	201
Wutai	64.80	81.17	69.28	67.91	91.73	75.40	100	125	107	105	142
Average by localities	*42.09*	...	*58.12**	...	*69.37*	*55.53*	*100*	...	*138*	...	*165*
East Central China											
Anhwei											
Laian (1921)	69.84	87.25	...	94.98	95.05	87.38	100	125	...	136	136
Laian (1922)	54.79	...	57.98	...	73.94	61.78	100	...	106	...	135
Wuhu	48.40	60.10	...	55.93	91.39	63.93	100	124	...	116	189
Chekiang											
Chinhai	102.15	...	118.90	...	121.76	114.04	100	...	116	...	119
Fukien											
Lienkiang	133.88	...	205.16	...	282.01	204.23	100	...	153	...	211
Kiangsu											
Kiangning (S)	189.32	183.53	...	181.32	180.75	183.40	100	97	...	96	95
Kiangning (T)	64.02	61.64	56.73	65.95	56.06	60.59	100	96	89	103	88
Wuchin	145.37	155.66	160.63	148.11	131.06	151.48	100	107	110	102	90
Average by localities	*100.97*	...	*116.46**	...	*129.00*	*115.85*	*100*	...	*115*	...	*128*
Average by 17 localities	*69.80*	...	*85.58**	...	*97.43*	*83.92*	*100*	...	*123*	...	*140*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

Size of farm and net profits per crop hectare.—Net profits per crop hectare are obtained by including the operator's own labor as well as that of his family as an expense. For all the localities studied, net profits per crop hectare averaged—$2.78 for farms in the small size-group and $21.29 for farms in the large size-group (table 12). The medians for the corresponding groups are-$0.12 and $7.43. Five localities suffered net losses per crop hectare but the loss decreased with the increase in the size of farm. In one locality, Wuchin Hsien, Kiangsu, the profits decreased with the increased size of farm because

TABLE 12.† RELATION OF SIZE OF FARM TO NET PROFITS PER CROP HECTARE

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NET PROFITS PER CROP HECTARE FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF NET PROFITS PER CROP HECTARE FOR DIFFERENT SIZE-GROUPS OF FARMS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
	$	$	$	$	$	$					
North China											
Anhwei											
Hwaiyuan	-40.56	-12.77	-7.39	-1.13	-1.50	-16.52	...	...	...	...	...
Su	2.41	...	13.42	...	4.56	6.46	100	...	557	...	189
Chihli											
Pingsiang	-46.32	...	-6.90	...	2.65	-15.91	...	...	...	...	...
Yenshan (1922)	-1.36	5.70	...	4.09	4.58	3.47	...	...	...	...	...
Yenshan (1923)	-34.31	...	-23.28	...	-18.83	-25.64	100	...	68	...	55
Honan											
Sincheng	9.18	12.33	...	8.75	22.08	12.04	100	134	...	95	241
Kaifeng	14.47	18.78	...	21.02	17.40	18.26	100	130	...	145	120
Shansi											
Wusiang	-43.32	-9.37	-2.61	9.53	6.30	-6.91	...	...	...	...	...
Wutai	8.22	20.30	30.45	27.71	33.51	23.36	100	247	370	337	408
Average by localities	*-14.62*	...	*3.68**	...	*7.86*	*-0.15*	*100*	...	*125*	...	*154*
East Central China											
Anhwei											
Laian (1921)	-6.71	19.39	...	29.36	30.08	19.03	...	...	...	...	...
Laian (1922)	-54.00	...	-23.74	...	-5.62	-27.73	...	...	...	...	...
Wuhu	-67.46	-36.17	...	-28.32	-3.56	-32.77	...	...	...	...	...
Chekiang											
Chinhai	18.83	...	36.55	...	32.08	29.05	100	...	194	...	170
Fukien											
Lienkiang	89.89	...	155.97	...	184.91	141.96	100	...	174	...	206
Kiangsu											
Kiangning (T)	-19.19	-14.43	-13.61	-7.38	-8.86	-12.47	...	...	...	...	...
Kiangning (S)	88.30	49.38	...	44.95	41.87	54.21	100	56	...	51	47
Wuchin	34.65	33.95	31.17	22.96	20.32	31.59	100	98	90	66	59
Average by localities	*10.54*	...	*28.13**	...	*36.40*	*25.36*	*100*	...	*267*	...	*345*
Average by 17 localities	*-2.78*	...	*15.19**	...	*21.29*	*11.35*	*100*	...	*646*	...	*866*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

†After type was set table 11 was purposely deleted.

expenses per mow of crop area increase greatly with size of farm. The degree of positive association, as shown by gross correlation coefficients, is low for eleven localities, moderate for three localities, and high for only one locality. Two localities show a low negative association. The average of all positive coefficients is +.223 (appendix II, tables 1 and 6).

There is little difference between North and East Central China in the increase in net profits per crop hectare with the increase in size of farm, showing that the relationship generally holds true.

That net profits per crop hectare have a marked association with operator's labor earnings is shown by the average gross correlation coefficient of +.534 for the seventeen localities where the crop mow is used to measure the relationship. One locality only has a low association, six have moderate, six have marked, and four have high association (appendix II, table 1 and 3).

Yields of crops as measured by the crop index show a low association, the gross correlation coefficient for sixteen localities being +.247; yields evidently are not very important in determining net profits per crop hectare.

One may conclude, then, that there is no argument in favor of the small farm since, even though small, the profits per hectare are less than on the farms in the large size-group. The reason is that the yields on the large farms are nearly, if not equally, as good as on the small farms and in addition the large farm is an economic unit of greater efficiency.

Size of farm and supplementary income.—The small size of the farm business would lead one to expect a greater supplementary income for the operators of farms in the small size-group. The fact that twice as many operators in the small size-group have supplementary income as compared with those in the large size-group points in the same direction (table 49, chapter III). While there is this definite relationship between proportion of operators having occupations in addition to farming, a classification of income from other than farm sources by size shows an income per adult-male unit for the families in the small size-group of $7.86 compared with $10.19 in the large size-group of farms (table 13). It is quite evident that size of farm does not determine the proportionate amount of other

income, nor does the proportion of farmers having other sources of income have any relationship to the average amount of income per adult-male unit.

Man-work Units and Profits

When sorted by man-work units per farm, the small farms average 112 work units, the medium sized farms average 244 work units, and the large sized farms average 519 work units. The farms in the group with the small number of man-work units have operator's labor earnings of $51 com-

TABLE 13. RELATION OF SIZE OF FARM TO AVERAGE INCOME FROM OTHER THAN FARM SOURCES PER ADULT-MALE UNIT

2209 farms, 12 localities, five provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	AVERAGE INCOME PER ADULT-MALE UNIT FROM OTHER THAN FARM SOURCES FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF AVERAGE INCOME PER ADULT-MALE UNIT FROM OTHER THAN FARM SOURCES FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$13.53	$4.29	$3.11	$3.84	$11.09	$7.68	100	32	23	28	82
Su	10.34	...	4.85	...	10.75	8.81	100	...	47	...	104
Chihli											
Pingsiang	1.52	...	2.63	...	4.86	3.41	100	...	173	...	320
Yenshan (1922)	12.41	2.97	...	2.31	2.42	3.78	100	24	...	19	20
Yenshan (1923)	8.02	...	5.68	...	1.87	4.42	100	...	71	...	23
Honan											
Sincheng	5.29	7.32	...	8.43	2.36	6.25	100	138	...	159	45
Kaifeng	5.49	2.09	...	0.24	0.18	1.34	100	38	...	4	3
Shansi											
Wusiang	9.79	8.79	8.88	7.75	15.47	10.34	100	90	91	79	158
Average by localities	*8.30*	...	*4.66**	...	*6.13*	*5.75*	*100*	...	*56*	...	*74*
East Central China											
Anhwei											
Laian (1922)	7.30	...	23.88	...	19.50	18.32	100	...	327	...	267
Kiangsu											
Kiangning (S)	6.88	7.06	...	10.59	24.36	14.16	100	103	...	154	354
Kiangning (T)	8.14	1.74	1.20	3.44	9.02	4.74	100	21	15	42	111
Wuchin	5.61	6.13	11.36	27.61	20.41	12.62	100	109	202	492	364
Average by localities	*6.98*	...	*12.23**	...	*18.32*	*12.46*	*100*	...	*175*	...	*262*
Average by 12 localities	*7.86*	...	*7.18**	...	*10.19*	*7.99*	*100*	...	*91*	...	*130*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

pared with $133 for farms in the group with the large number of man-work units (table 14). This relationship is about the same in North and in East Central China. The association between man-work units and operator's labor earnings is also shown for various measures of profits by the gross correlation coefficient for operator's labor earnings of +.469 for fourteen localities, of

TABLE 14. RELATION OF MAN-WORK UNITS TO OPERATOR'S LABOR EARNINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	OPERATOR'S LABOR EARNINGS PER FARM FOR FARMS GROUPED BY NUMBER OF MAN-WORK UNITS PER FARM						RATIOS OF OPERATOR'S LABOR EARNINGS PER FARM FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average for all farms	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei	$	$	$	$	$	$					
Hwaiyuan	-14.16	-11.11	...	-2.16	11.93	-2.91	...	...	...	...	...
Su	25.13	...	89.57	...	114.98	73.36	100	...	356	...	458
Chihli											
Pingsiang	9.16	...	29.44	...	44.79	27.39	100	...	321	...	489
Yenshan (1922)	26.12	...	37.22	...	56.76	39.68	100	...	142	...	217
Yenshan (1923)	-10.73	...	-43.54	...	-132.78	-63.48	...	...	...	...	...
Honan											
Sincheng	46.47	...	71.52	...	153.27	91.04	100	...	154	...	330
Kaifeng	106.12	...	169.77	...	257.54	174.55	100	...	160	...	243
Shansi											
Wusiang	36.41	....	51.20	...	69.94	51.29	100	...	141	...	192
Wutai	83.23	114.16	...	94.40	162.96	108.45	100	137	...	113	196
Average by localities	*34.19*	...	*55.36**	...	*82.15*	*55.48*	*100*	...	*162*	...	*240*
East Central China											
Anhwei											
Laian (1921)	65.73	120.55	...	158.83	172.08	132.01	100	183	...	242	262
Laian (1922)	6.68	...	-12.44	...	62.65	19.94	100	...	...	...	938
Wuhu	28.34	39.47	...	81.61	123.25	55.56	100	139	...	112	435
Chekiang											
Chinhai	92.54	...	135.72	...	184.28	134.83	100	...	147	...	199
Fukien											
Lienkiang	114.39	...	162.24	...	430.30	258.75	100	...	142	...	376
Kiangsu											
Kiangning (S)	173.62	...	234.89	...	370.95	255.75	100	...	135	...	214
Kiangning (T)	39.05	...	38.39	...	45.49	41.27	100	...	98	...	116
Wuchin	36.18	63.55	80.63	100.19	126.48	88.61	100	176	223	277	350
Average by localities	*69.57*	...	*101.83**	...	*189.44*	*123.34*	*100*	...	*146*	...	*272*
Average by 17 localities	*50.84*	...	*77.23**	...	*132.64*	*87.42*	*100*	...	*152*	...	*261*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

+.227 for net profits per crop hectare and of +.776 for labor returns per farm (appendix 11, tables 1, 3, and 4). These coefficients vary as they do quite largely because of the effect of including or excluding the value of all labor or the value of unpaid or hired labor as an expense when computing these measures of profits. Since labor returns represent the returns to labor after other expenses have been deducted, it is natural that the association is high. It may be concluded that the greater the amount of work accomplished the greater are the profits, but not in the same proportion.

Amount of Farm Capital and Farm Labor Earnings

In a successful farm business it is only natural that farm labor earnings should increase with the amount of capital invested. This is true for the localities studied as is shown by a grouping of farms by capital (table 22, chapter III). The average farm labor earnings of $150 for farms in the largest capital-group is nearly three times greater than the farm labor earnings of $54.00 for farms in the smallest capital-group (table 15). In North China the difference is 3.7 times and in East Central China 2.4 times more; apparently in North China there is an adjustment of values nearer to farm values than there is in East Central China. For all but the three localities of Wuhu Hsien, Anhwei, Kiangning Hsien (T), Kiangsu, and Wuchin Hsien, Kiangsu, each succeeding capital size-group shows an increase in farm labor earnings. In these places it does not hold true between the medium or the medium large and the large size-group because of proportionately higher land values and more expensive buildings. Amount of capital really measures size of farm in China, since most of the farm capital is invested in land, and it is only natural that both amount of capital and size of farm should show about the same increase in farm labor earnings.

Exceptional Relationships of Size of Farm to Profits.

Some of the outstanding exceptional relationships of size of farm to various measures of profits are here discussed by localities. In certain cases only one factor causes the exception while in others it may be a combination of many factors. Usually the reason can be found from a careful scrutiny of

the various relationships for the different factors. The tables especially useful for such study are those where the variables have been classified separately by each locality (appendix I, tables 1-17). For convenience, local units of measure have been kept for these studies by localities.

Hwaiyuen Hsien, Anhwei.—The measures of profits at Hwaiyuen Hsien, Anhwei, increase with the increase in size of farms for each succeeding size-group with the exception of operator's labor earnings, farm labor earnings, and net profits per crop mow. Operator's labor earnings and farm labor earnings are a loss for the first three size-groups, a distinct gain for the

TABLE 15. RELATION OF CAPITAL TO FARM LABOR EARNINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Average farm labor earnings for farms grouped by capital						Ratios of farm labor earnings for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average for all farms	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei	$	$	$	$	$	$					
Hwaiyuan	-14.11	...	-8.99	...	9.97	-3.12	...	...	...	...	...
Su	24.23	59.70	...	68.68	125.80	70.33	100	246	...	283	519
Chihli											
Pingsiang	10.95	...	30.50	...	43.84	26.94	100	...	279	...	400
Yenshan (1922)	22.99	42.91	...	40.20	55.94	39.68	100	187	...	175	243
Yenshan (1923)	-6.10	-31.00	...	-51.58	-167.93	-64.16	...	...	...	...	...
Honan											
Sincheng	28.14	58.07	...	70.34	133.77	87.97	100	206	...	250	475
Kaifeng	80.25	143.50	...	196.10	261.39	175.03	100	179	...	244	326
Shansi											
Wusiang	33.55	49.85	...	60.82	62.79	50.36	100	149	...	181	187
Wutai	90.66	110.65	...	341.96	477.46	277.52	100	122	...	377	527
Average by localities	*30.06*	...	*67.52**	...	*111.44*	*73.39*	*100*	...	*225*	...	*371*
East Central China											
Anhwei											
Laian (1921)	87.66	129.69	...	240.42	270.32	191.49	100	148	...	274	308
Laian (1922)	3.16	...	-1.01	...	46.69	10.61	...	...	...	...	...
Wuhu	10.33	...	22.00	...	14.79	16.60	100	...	213	...	143
Chekiang											
Chinhai	169.24	...	108.93	...	145.51	137.14	100	...	64	...	86
Fukien											
Lienkiang	121.61	166.55	...	309.82	608.71	286.68	100	137	...	255	501
Kiangsu											
Kiangning (S)	177.66	...	223.48	...	368.20	253.08	100	...	126	...	207
Kiangning (T)	21.08	...	20.83	...	13.39	19.09	100	...	99	...	64
Wuchin	50.36	76.46	128.68	110.26	87.60	91.74	100	152	256	219	174
Average by localities	*80.14*	...	*111.73**	...	*194.40*	*125.80*	*100*	...	*139*	...	*243*
Average by 17 localities	*53.62*	...	*88.33**	...	*150.48*	*98.06*	*100*	...	*165*	...	*281*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

medium large size-group, but a loss for the large size-group. The low yields of crops for the particular year studied are chiefly responsible for such losses. The larger labor earnings in the medium size-group are caused partly by labor efficiency almost equal with that in the large size-group, as shown by number of crop mow per man and by man-work units per man. There is also a lower labor cost per crop mow of $0.98 in the medium size-group compared with $1.12 for farms in the large size-group. The difference between receipts and farm expenses per mow of crop area in the medium size-group, $2.11 compared with $1.93 for the large size-group, gives a balance of $0.18 per mow in favor of the medium large size-group. Another important factor in causing larger labor earnings on the farms in the medium large size-group is the interest on capital investment per mow, which is only $1.74 compared with $1.93 for the farms in the large size-group.

Net profits per crop mow also show somewhat the same relationship in that the loss is slightly greater for farms in the large size-group than in the medium large size-group. Contrary to the relationship for most other localities, labor returns per man-work unit increase slightly with the increase in size of farm up to the medium large size-group, apparently showing a good adjustment between size of farm and amount of man labor used for farm purposes. For the same reason the labor returns per man-equivalent increase more closely with increase in size of farm than in other localities.

Since the family earnings per farm and per adult-male unit are greatest for farms in the large size-group, these farms are the most desirable. This is especially true since the difference in favor of the farms in the large size-group is not alone due to the interest charged on investment.

Su Hsien, Anhwei.—Su Hsien also shows an exception to the general rule of increase in profits with each succeeding size of farm group in that operator's labor earnings and farm labor earnings are nearly the same for the medium size-group as for the large size-group. This is accounted for by land values fifteen per cent lower, a crop index of yields 22 per cent lower, and an index of double cropping twelve per cent lower for the farms in the large size-group compared with those in the medium size-group. A considerable amount of land on these

farms in the large size-group is low land and subject to flood in the summer after wheat harvest; this naturally decreases the amount of double cropping and also gives lower yields as is evidenced not only by the crop index but also by the gross correlation coefficient for crop mow and crop index of $-.530 \pm .029$ (appendix II, table 2). These conditions result in farm earnings per crop area mow of $5.48 for the medium size-group, and $3.18 per crop area mow for the large size-group, thus accounting for the relationship.

Labor returns per man-equivalent, and net profits per crop mow show much lower values in the large as compared with the medium size-group. The reasons are the same as given above for labor earnings.

Since the class intervals used for this locality were rather large, another sort was made and the new class intervals were selected on the basis of twenty or more farms to an interval by narrowing the limits of the interval as much as possible. With this new grouping the farms in the 40-49.9 mow class gave almost the same operator's labor earnings, as the next higher group, having twenty or more farms of 100-124.9 mow. This shows about the same relationship to the 40-49 mow class as does the large size-group to the medium size-group in the original classification. The advantage of this narrower grouping is that, for the farms studied, the exact sizes at which changes take place can be more definitely stated. Here, as in the case of Hwaiyuen Hsien, the farms in the large size-group of the original classification, or in the 100-124.9 mow group, show higher family earnings per farm and per adult-male unit. These higher amounts, however, only approximately equal the interest charge on the investment. It may be concluded, therefore, that from the standpoint of labor earnings, farms of 40-49.9 mow and of 100-124.9 mow are nearly equally desirable, and that farms of a smaller size than forty mow are distinctly less desirable.

It should also be mentioned that cross tabulation for the 40-49.9 and the 100-124.9 mow groups was made for a number of other factors, the results of which show no significant relationships. The factors were type of land tenure, yields, kind and acreage of crops planted for each class of tenure, and cost of fertilizer per crop mow.

Pingsiang Hsien, Chihli.—The increase in operator's labor earnings and farm labor earnings with increase in size of farm is not pronounced because expenses increase and receipts decrease with each succeeding size-group. Expenses increase chiefly because labor cost per crop mow increases from $0.81 to $1.13. Less double cropping is probably partly responsible for the decreasing receipts with the increase in size of farm.

Yenshan Hsien (1923), Chihli.—Relationship between size of farm and profits for Yenshan Hsien (1923), show losses with increase in size of farm for all measures of profits except farm earnings, family earnings, and family earnings per adult-male unit. This, as already explained elsewhere, is because of the failure of the wheat crop. Expenses increased with the size of farm, but receipts did not increase with size of farm and therefore loss was incurred. These losses are aggravated by the increase in interest on capital investment per mow with the increase in size of farm which in turn is caused by higher land values for farms in the large size-group.

Wusiang Hsien, Shansi.—Operator's labor earnings and farm labor earnings at Wusiang Hsien, Shansi, are highest in the medium large size-group rather than in the large size-group, the reason being that receipts per mow of crop area are $0.16 lower and expenses per mow of crop area are $0.63 higher and interest on capital investment per mow is $0.29 higher in the large size-group. This accounts for the labor earnings in this group being smaller than in the medium large size-group.

Kiangning Hsien, Kiangsu.—Both operator's labor earnings and farm labor earnings fail to increase with the increase in size of farm beyond the medium large size-group for farms in Kiangning Hsien (T), Kiangsu. The difference of $0.38 between farm receipts and farm expenses in favor of the medium size-group is one factor accounting for this condition. Another factor is the charge on investment per mow of crop area, which is $0.43 greater in the large than in the medium size-group. This is because of the higher value of buildings, which is $0.95 more per mow of crop area in the large than in the medium large size-group. In fact, the increase of capital per mow of crop area with the increase in the size of farm, in addition to low crop yields, prevents the relationship of size of farm and amount of profits from becoming more pronounced.

Wuchin Hsien, Kiangsu.—Operator's labor earnings and farm labor earnings increase with size of farm at Wuchin Hsien, Kiangsu, until the medium size-group is reached. This is in spite of increasing farm expenses. For the two succeeding size-groups, however, farm expenses continue to increase, until, for the large size-group, they are $15.48 per mow of crop area or nearly twice that of $6.70 for the small size-group. Increases in cost of labor, feed, and fertilizer with increase in size largely account for this relationship.

Since farm earnings and family earnings are not very much greater in the large than in the medium large size-group, and since family earnings per adult-male unit are largest in the medium large size-group but smaller in the large size-group, it may be concluded that in Wuchin farms in the medium large size-group are the most desirable.

SIZE OF FARM AND EFFICIENCY FACTORS

Size of Farm in Relation to Labor Efficiency

Efficiency of man and animal labor on farms in different size-groups may be determined by the number of units of land cultivated per man-equivalent or per labor animal unit and by the number of man-work units per man or the number of animal-work units per labor animal unit.

While work units are the most accurate measure, still, for a given locality where the same kind of crops are grown and where the soil and topographical conditions are the same and where farm practice differs little on the large and small farms, the number of units of land per man-equivalent is an effective measure of labor efficiency.

Crop hectares per man-equivalent. — The average crop hectare per man shows a mean of 1.71 and a median of 1.43 hectares or 3.5 acres. The coefficient of variability is 40.43 per cent which is slightly higher than for man-work units per man-equivalent (table 16).

On the farms classified in the small size-group the average crop hectares per man-equivalent are 1.10; in the medium size-group, 1.74; and in the large size-group, 2.33, or nearly twice as many for the latter as for the former (table 17). The difference between the two extreme groups is 2.5 times greater in North China and 1.5 times greater in East Central China, caused by relatively more crop hectares per man-equivalent in

TABLE 16. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY OF CROP HECTARE PER MAN-EQUIVALENT

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	2.36±0.07	2.28±0.09	1.12±0.05	47.46±2.45
Su	3.79±0.08	3.85±0.10	2.03±0.06	53.56±1.89
Chihli				
Pingsiang	0.88±0.03	0.74±0.04	0.52±0.02	59.09±2.97
Yenshan (1922) ..	1.82±0.04	1.70±0.05	0.81±0.03	44.51±2.05
Yenshan (1923) ..	2.50±0.07	2.31±0.09	1.27±0.05	50.80±2.59
Honan				
Sincheng	1.49±0.04	1.32±0.05	0.76±0.03	51.01±2.50
Kaifeng	2.11±0.04	2.08±0.05	0.72±0.03	34.12±1.48
Shansi				
Wusiang	1.50±0.03	1.43±0.04	0.68±0.02	45.33±1.63
Wutai	2.97±0.05	3.13±0.06	1.15±0.04	38.72±1.40
Average by localities	*2.16*	*2.08*	*1.01*	*47.18*
East Central China				
Anhwei				
Laian (1921) ..	1.01±0.02	1.04±0.03	0.28±0.01	27.72±1.41
Laian (1922) ..	0.95±0.03	0.90±0.04	0.41±0.02	43.16±2.41
Wuhu	0.91±0.02	0.90±0.03	0.26±0.01	28.57±1.45
Chekiang				
Chinhai	0.80±0.01	0.77±0.01	0.15±0.01	18.75±1.14
Fukien				
Lienkiang	0.58±0.02	0.50±0.03	0.33±0.01	56.90±2.73
Kiangsu				
Kiangning (S) ..	2.25±0.03	2.24±0.04	0.61±0.02	27.11±0.97
Kiangning (T) ..	1.12±0.02	1.05±0.03	0.40±0.01	35.71±1.29
Wuchin	2.06±0.02	2.03±0.03	0.51±0.01	24.76±0.74
Average by localities	*1.21*	*0.97*	*0.37*	*32.84*
Average by 17 localities	*1.71*	*1.43*	*0.71*	*40.43*

the large size-group in North China. The degree of association, as shown by gross correlation coefficients, is low for two localities, moderate for one locality, marked for ten localities, and high for four localities. The average of the coefficients for all localities is +.602 (appendix II, tables 1 and 2).

The effect of this greater labor efficiency on the larger farms is a marked association between operator's labor earnings

TABLE 17. RELATION OF SIZE OF FARM TO CROP HECTARE PER MAN-EQUIVALENT

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CROP HECTARE PER MAN-EQUIVALENT FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF CROP HECTARES PER MAN-EQUIVALENT FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	1.32	2.05	2.52	3.36	3.50	2.36	100	155	191	255	265
Su	2.20	...	3.79	...	5.59	3.79	100	...	172	...	254
Chihli											
Pingsiang	0.53	...	0.90	...	1.19	0.88	100	...	170	...	225
Yenshan (1922)	1.18	1.61	...	2.19	2.38	1.82	100	136	...	186	202
Yenshan (1923)	1.58	...	2.58	...	3.39	2.50	100	...	163	...	215
Honan											
Sincheng	0.97	1.36	...	1.60	2.68	1.49	100	140	...	165	276
Kaifeng	1.28	1.98	...	2.22	2.75	2.11	100	155	...	173	215
Shansi											
Wusiang	0.79	1.17	1.52	2.02	2.17	1.50	100	148	192	256	275
Wutai	1.48	2.38	3.41	3.55	4.60	2.97	100	161	230	240	311
Average by localities	*1.26*	...	*2.19**	...	*3.14*	*2.16*	*100*	...	*174*	...	*249*
East Central China											
Anhwei											
Laian (1921)	0.79	1.00	...	1.13	1.10	1.01	100	127	...	143	139
Laian (1922)	0.59	...	0.92	...	1.39	0.95	100	...	156	...	236
Wuhu	0.59	0.86	...	0.98	1.23	0.91	100	146	...	166	208
Chekiang											
Chinhai	0.68	...	0.80	...	0.91	0.80	100	...	118	...	134
Fukien											
Lienkiang	0.30	...	0.57	...	0.91	0.58	100	...	190	...	303
Kiangsu											
Kiangning (S)	1.61	2.33	...	2.42	2.49	2.25	100	145	...	150	155
Kiangning (T)	1.02	1.01	1.12	1.21	1.22	1.12	100	99	110	119	120
Wuchin	1.87	2.07	2.23	2.17	2.14	2.06	100	111	119	116	114
Average by localities	*0.93*	...	*1.23**	...	*1.42*	*1.21*	*100*	...	*132*	...	*153*
Average by 17 localities	*1.10*	...	*1.74**	...	*2.33*	*1.71*	*100*	...	*158*	...	*211*

*In obtaining this average, those places having farms in the medium small medium and medium large groups are all classified under medium.

and crop mow per man-equivalent apparent in the gross correlation coefficient of +.409 for sixteen localities (appendix II, tables 1 and 3).

For profits as measured by labor returns per man-equivalent the association is greater as is shown by the coefficient of +.540 for the seventeen localities (appendix II, table 5). A great association also occurs for labor returns and this is seen in the coefficient of +.482 for sixteen localities (appendix II, table 4).

Man-work units per man-equivalent.—The greater efficiency of man labor on large farms is more accurately shown in the difference in number of man-work units on small and large farms than by crop hectares per man-equivalent, because man-work units measure work actually accomplished. The average number of work units per man as represented by the mean is 119 and by the median 109. The variability is smaller than

TABLE 18. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY OF MAN-WORK UNITS PER MAN

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	105.8±2.97	101.4±3.72	49.09±2.10	46.40±2.38
Su	155.1±3.31	149.6±4.15	83.04±2.34	53.54±1.89
Chihli				
Pingsiang	54.3±1.86	48.6±2.33	33.96±1.31	62.54±3.23
Yenshan (1922) ..	91.8±2.27	87.4±2.85	41.12±1.60	44.79±2.06
Yenshan (1923) ..	122.0±3.44	114.3±4.31	58.84±2.44	48.23±2.42
Honan				
Sincheng	69.2±1.95	61.3±2.44	34.63±1.37	50.04±2.43
Kaifeng	86.7±1.59	84.1±1.99	28.69±1.12	33.09±1.43
Shansi				
Wusiang	119.4±3.09	114.0±3.87	72.50±2.18	60.72±2.41
Wutai	230.8±4.00	242.8±5.01	89.19±2.83	38.64±1.40
Average by localities	*115.0*	*101.4*	*54.56*	*48.67*
East Central China				
Anhwei				
Laian (1921) ..	110.1±1.81	108.5±2.27	27.02±1.28	24.54±1.23
Laian (1922) ..	104.9±2.48	99.2±3.11	36.81±1.76	35.09±1.87
Wuhu	82.5±1.47	81.4±1.84	22.00±1.04	26.67±1.35
Chekiang				
Chinhai	144.5±2.38	142.2±2.98	28.84±1.68	19.96±1.21
Fukien				
Lienkiang	119.4±3.43	103.1±4.30	64.52±2.43	54.04±2.56
Kiangsu				
Kiangning (S) ..	152.1±1.66	145.7±2.08	35.07±1.17	23.06±0.81
Kiangning (T) ..	123.7±1.85	120.6±2.32	40.43±1.31	32.68±1.17
Wuchin	156.7±1.66	151.5±2.08	42.64±1.17	27.21±0.80
Average by localities	*124.2*	*114.6*	*37.17*	*30.41*
Average by 17 localities	*119.4*	*108.5*	*46.38*	*40.07*

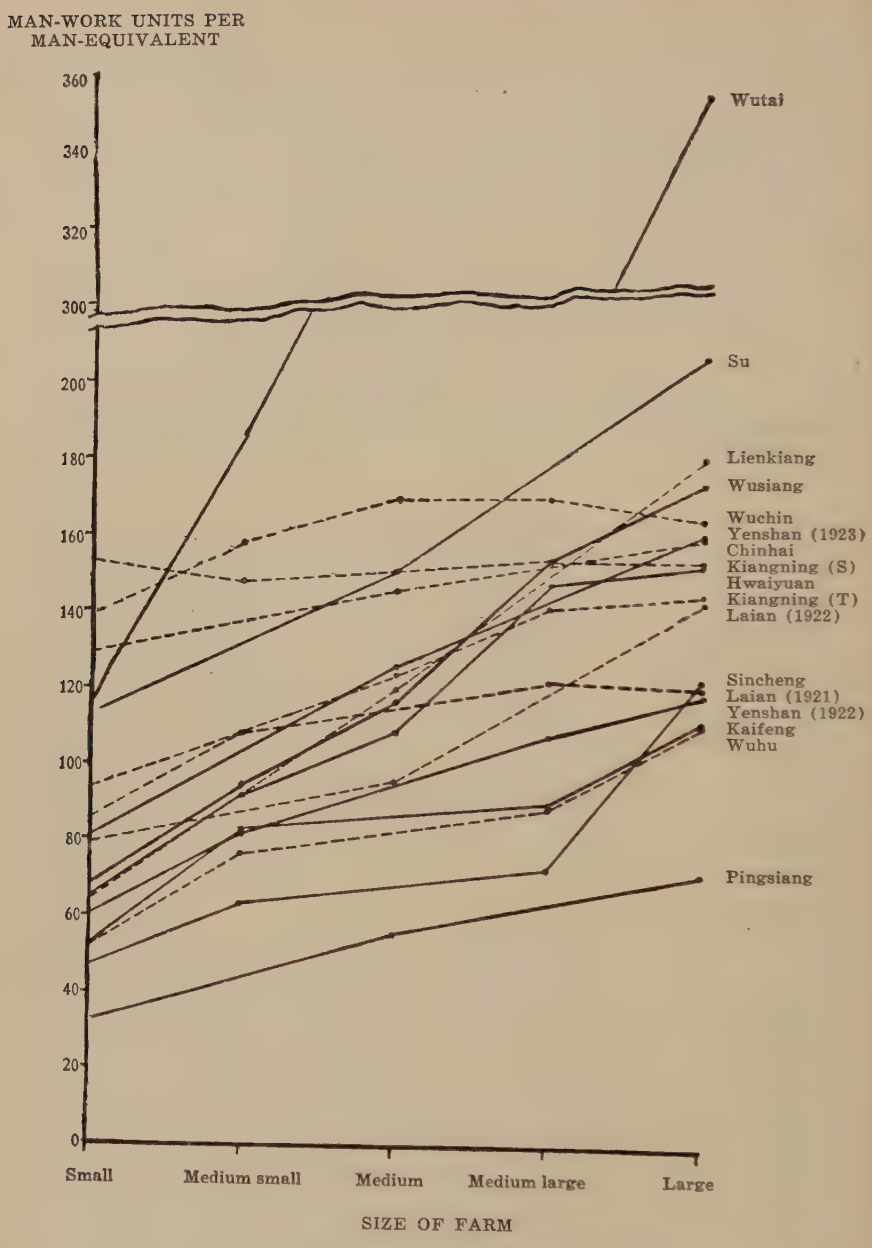

Fig. 2. Relation of size of farm to man-work units per man-equivalent.

2866 farms, 17 localities, seven provinces, China (1921-1925).

for either man-work units per farm or man-equivalent per farm, shown by the coefficient of variability of 40.07 percent (table 18). There are 84.1 man-work units per man-equivalent for farms in the small size-group, 119.8 for farms in the medium size-group, and 156.2 for farms in the large size-group (table 19). In other words, a farmer on a large farm does nearly twice the amount of work of one on a small farm. The degree of association, as shown by gross correlation coefficients, is positive and is very low for one locality, moderate for four localities, marked for nine localities, high for two localities, and very close for one

TABLE 19. RELATION OF SIZE OF FARM TO MAN-WORK UNITS PER MAN-EQUIVALENT

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Man-work units per man for farms grouped by size of farm						Ratios of man-work units per man for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	65.2	91.7	109.1	147.8	152.6	105.8	100	141	167	227	234
Su	112.6	...	151.3	...	206.8	155.1	100	...	134	...	183
Chihli											
Pingsiang	32.2	...	56.1	...	72.3	54.3	100	...	174	...	225
Yenshan (1922)	60.8	81.6	...	108.3	118.9	91.8	100	134	...	178	196
Yenshan (1923)	80.9	...	125.9	...	160.9	122.0	100	...	156	...	199
Honan											
Sincheng	46.5	63.7	...	73.3	123.2	69.2	100	137	...	158	265
Kaifeng	51.8	82.6	...	89.8	112.1	86.7	100	159	...	173	216
Shansi											
Wusiang	67.8	95.2	116.9	153.6	174.0	119.4	100	140	172	227	257
Wutai	116.3	185.8	266.4	275.8	355.0	230.8	100	160	229	237	305
Average by localities	*70.5*	...	*115.5**	...	*164.0*	*115.0*	*100*	...	*164*	...	*233*
East Central China											
Anhwei											
Laian (1921)	85.4	108.7	...	122.2	121.1	110.1	100	127	...	143	142
Laian (1922)	79.2	...	96.1	...	143.0	104.9	100	...	121	...	181
Wuhu	53.1	77.3	...	89.0	110.8	82.5	100	146	...	168	209
Chekiang											
Chinhai	129.1	...	146.1	...	159.7	144.5	100	...	113	...	124
Fukien											
Lienkiang	64.1	...	119.9	...	180.9	119.4	100	...	187	...	282
Kiangsu											
Kiangning (S)	153.0	147.8	...	153.9	154.2	152.1	100	97	...	101	101
Kiangning (T)	93.2	109.2	124.0	142.1	144.7	123.7	100	117	133	152	155
Wuchin	139.2	157.8	170.1	169.7	164.6	156.7	100	113	122	122	118
Average by localities	*99.5*	...	*124.6**	...	*147.4*	*124.2*	*100*	...	*125*	...	*148*
Average by 17 localities	*84.1*	...	*119.8**	...	*156.2*	*119.4*	*100*	...	*142*	...	*186*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

locality. The average of the coefficients for seventeen localities is +.587 (appendix II, tables 1 and 2).

Here, as for crop hectares per man-equivalent, the greater labor efficiency shows almost exactly the same relationship with operator's labor earnings. This is evidenced by the gross correlation coefficient of +.409 for sixteen localities (appendix II, table 1).

If the effect of greater labor efficiency shown by the larger number of man-work units per man is correlated with labor returns per man-equivalent, a gross correlation coefficient of +.568 is obtained (appendix II, table 5). When correlated with net profits per crop hectare the coefficient is +.405 for seventeen localities (appendix II, table 6). It is quite evident, therefore, that labor efficiency increases profits.

Man labor efficiency, then, as measured by the number of crop hectares per man-equivalent and by the man-work units per man-equivalent, shows nearly the same degree of efficiency for the different sizes of farms as measured by farm area. A better criterion, however, of the degree of association of man-work units per man-equivalent with crop hectares per man-equivalent is the gross correlation coefficient for these two factors which is +.835, a figure showing a high association. Evidently as the size of farm increases, as measured by crop hectares, the man-work units per man-equivalent do not increase at the same rate. This may be caused by a smaller amount of work being done per hectare on the larger farms, thus keeping the man-work units from increasing in the same proportion. A difference in the amount of work for the same crop, or for different crops, affects such a relationship.

Crop hectares per labor animal unit.—The difference in animal labor efficiency on small and large farms is not shown so clearly because of the fact that small farms often use animals borrowed or sometimes hired from large farms. For farms having labor animals the small size-group have 2.04 crop hectares per labor animal unit, those in the medium size-group 3.10, and those in the large size-group 3.66, showing a greater efficiency of one and four-fifth times between the two extreme groups (table 20). Farmers realize the inefficiency of keeping labor animals for only a small amount of work and hence a partial adjustment has been made by some farmers hiring or borrowing all animal labor and by other farmers keeping

TABLE 20. RELATION OF SIZE OF FARM TO CROP HECTARES PER LABOR ANIMAL UNIT

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CROP HECTARES PER LABOR ANIMAL UNIT FOR FARMS GROUPED BY SIZE OF FARM AREA						RATIOS OF CROP HECTARES PER LABOR ANIMAL UNIT FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Haiyuan	2.91	3.28	3.59	5.26	4.93	4.48	100	113	123	181	169
Su	2.17	...	3.07	...	5.05	4.10	100	...	141	...	233
Chihli											
Pingsiang	0.87	...	1.23	...	2.35	1.89	100	...	141	...	270
Yenshan (1922)	3.00	3.30	...	4.55	3.96	3.94	100	110	...	152	132
Yenshan (1923)	5.31	...	6.99	...	5.82	6.10	100	...	132	...	110
Honan											
Sincheng.	3.53	3.84	...	3.90	4.75	4.06	100	109	...	110	135
Kaifeng	2.44	3.06	...	2.85	3.70	3.24	100	125	...	117	152
Shansi											
Wusiang	†	3.92	4.22	4.29	4.23	4.20	...	...	...	...	...
Wutai	2.79	3.37	4.66	4.87	4.70	4.21	100	121	167	174	168
Average by localities	*2.56*	...	*3.84**	...	*4.39*	*4.02*	*100*	...	*148*	...	*171*
East Central China											
Anhwei											
Laian (1921)	1.97	1.94	...	2.36	1.87	2.01	100	98	...	120	95
Laian (1922)	1.35	...	1.68	...	2.34	1.94	100	...	124	...	173
Wuhu	2.23	2.37	...	2.85	3.55	2.96	100	106	...	128	159
Chekiang											
Chinhai	†	...	1.25	...	1.39	1.35	...	...	...	...	...
Fukien											
Lienkiang	0.32	...	0.75	...	1.98	1.20	100	...	234	...	619
Kiangsu											
Kiangning (S)	1.80	2.84	...	3.78	4.48	3.78	100	158	...	210	249
Kiangning (T)	3.04	4.27	5.12	4.96	4.38	4.60	100	140	168	163	144
Wuchin	0.95	1.42	1.95	2.46	2.75	1.92	100	149	205	259	289
Average by localities	*1.46*	...	*2.26**	...	*2.84*	*2.47*	*100*	...	*155*	...	*195*
Average by 17 localities	*2.04*	...	*3.10**	...	*3.66*	*3.29*	*100*	...	*152*	...	*179*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.
†No labor animals were kept on these farms.

smaller or larger animals and by still others owning one-half, one-third, or even one-fourth of an animal with some neighbor.

Animal-work units per labor animal unit.—A labor animal unit on farms in the small size-group accomplishes 36.3 animal-work units compared with 59.1 in the medium size-group, and 70.3 in the large size-group (table 21). In North China the difference between the extreme size-groups is 1.7, whereas in East Central China it is 2.6 times greater. Perhaps the smaller difference for North China is due to an adjustment in the use of animals of varying sizes; for instance, in East

Central China the animals are usually either water buffaloes or oxen of fairly good size, whereas in North China donkeys or small oxen are often used. In this way a team may be composed of two small animals or several small ones or a small and a large one or two or three large ones.

Size of Farm in Relation to Quality of Farm Business

Crop yields.—There is an impression among many people that the smaller a farm is the greater is the yield, on the basis that a small farm makes possible better care of crops. The theory is prevalent in both the West and in the Orient but facts

TABLE 21. RELATION OF SIZE OF FARM TO ANIMAL WORK UNITS PER LABOR ANIMAL UNIT FOR FARMS HAVING LABOR ANIMALS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	LABOR ANIMAL WORK UNITS PER LABOR ANIMAL UNIT FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF LABOR ANIMAL WORK UNITS PER LABOR ANIMAL UNIT FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	43.1	47.4	52.0	77.6	72.1	63.5	100	110	121	180	167
Su	30.6	...	42.4	...	76.5	60.6	100	...	139	...	250
Chihli											
Pingsiang	14.7	...	20.6	...	39.1	31.4	100	...	140	...	266
Yenshan (1922)	46.6	51.8	...	71.1	62.5	61.9	100	111	...	153	134
Yenshan (1923)	82.6	...	108.0	...	88.0	93.0	100	...	131	...	107
Honan											
Sincheng	92.4	97.0	...	99.4	123.1	104.1	100	105	...	108	133
Kaifeng	87.5	112.9	...	104.2	133.8	117.8	100	129	...	119	153
Shansi											
Wusiang	†	99.9	102.6	101.3	95.1	98.5	...	...	...	...	...
Wutai	71.9	83.2	114.2	115.2	114.5	102.5	100	116	159	160	159
Average by localities	*52.2*	...	*78.2**	...	*89.4*	*81.5*	*100*	...	*150*	...	*171*
East Central China											
Anhwei											
Laian (1921)	48.5	49.3	...	59.5	48.3	51.3	100	102	...	123	100
Laian (1922)	32.5	...	41.3	...	58.2	47.8	100	...	127	...	179
Wuhu	13.6	15.6	...	17.2	22.3	18.9	100	115	...	126	164
Chekiang											
Chinhai	†	...	88.8	...	103.0	99.2	...	...	...	...	...
Fukien											
Lienkiang	12.6	...	29.9	...	72.9	45.0	100	...	237	...	579
Kiangsu											
Kiangning (S)	14.3	24.3	...	31.2	35.9	30.8	100	170	...	218	251
Kiangning (T)	15.0	19.8	19.7	18.8	15.5	17.4	100	132	131	125	103
Wuchin	11.9	17.5	23.7	30.7	35.0	23.6	100	147	199	258	294
Average by localities	*18.6*	...	*37.5**	...	*43.9*	*41.3*	*100*	...	*202*	...	*268*
Average by 17 localities	*36.3*	...	*59.1**	...	*70.3*	*62.8*	*100*	...	*163*	...	*194*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

†No labor animal.

do not support the assumption in either hemisphere. The difference in yields for the different size-groups of farms is determined by use of the crop index, which is a composite measure of yields of all crops. As explained under definitions in the first chapter, the yields for all farms surveyed in a given locality are taken as 100 and then the variation of each farm from this average is found. The farms in this study (table 22)

TABLE 22. RELATION OF SIZE OF FARM TO CROP YIELDS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CROP INDEX† FOR FARMS GROUPED BY SIZE					
	Small	Medium Small	Medium	Medium large	Large	Crop index (all farms)
North China						
Anhwei						
Hwaiyuan	104	99	101	96	103	100
Su	119	...	118	...	92	100
Chihli						
Pingsiang	102	...	89	...	103	100
Yenshan (1922)	108	102	...	101	100	100
Yenshan (1923)	86	...	96	...	102	100
Honan						
Sincheng	104	101	...	100	98	100
Kaifeng	113	101	...	102	98	100
Shansi						
Wusiang	101	99	96	101	102	100
Wutai	102	100	103	98	98	100
Average by localities	*104*	...	*101**	...	*100*	*100*
East Central China						
Anhwei						
Laian (1921)	100	98	...	98	101	100
Laian (1922)	114	...	111	...	93	100
Wuhu	100	102	...	103	102	100
Chekiang						
Chinhai	99	...	102	...	99	100
Fukien						
Lienkiang	95	...	99	...	101	100
Kiangsu						
Kiangning (S)	100	99	...	98	101	100
Kiangning (T)	105	96	96	107	100	100
Wuchin	96	95	101	103	104	100
Average by localities	*101*	...	*101**	...	*100*	*100*
Average by 17 localities	*103*	...	*101**	...	*100*	*100*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

†These indices for each locality will not average 100 because they are averages of averages.

have an average crop index for the small, medium, and large size-groups of farms of 103, 101, and 100. Median numbers of 102 for the small size-group and of 101 for the largest size-group of farms show even a smaller difference. The degree of positive association, as shown by gross correlation coefficients, is low for eleven localities and, as shown by negative association, is low for three localities, moderate for two localities, and marked for one locality (appendix II, tables 1 and 2). The average of the positive coefficients is only +.112.

In North China the relationship is slightly more in favor of the small farms than in East Central China, where the difference is only one point. A careful comparison of all localities, however, shows that Su Hsien, Anhwei, Yenshan Hsien (1922), Chihli, Kaifeng Hsien, Honan, and Laian Hsien (1923), Anhwei, have significantly higher yields on the small farms. The small farm, in order to support the farm family, cannot have as much unproductive land (such as low, alkali, or sandy land) as the large farm, and it is because of this larger proportion of better land that the yields on small farms in some localities are greater than on the large farms. Size of farm in and of itself does not determine yields.

Variability of yields between farms within each locality is naturally not very great since, in most cases, the soil and climatic factors are usually more constant than between widely separated localities. Sometimes, however, there are variations in soils of a locality and this, together with difference in fertilizing and tillage methods, accounts for an average coefficient of variability of 18.66 per cent for the seventeen localities with little difference between North and East Central China averages (table 23). The lowest coefficient, 4.47, occurs at Chinhai Hsien, Chekiang, where the land is very uniform and irrigation available for all fields. The highest coefficient of variability, 35.92, is found at Yenshan Hsien (1923), Chihli, where there are great differences in the soils, chiefly in the alkali content.

Crop yields, while little affected by the size of farm, apparently do have some relationship to profits, as is evidenced by a gross correlation coefficient for fifteen localities of +.317 for operator's labor earnings, and of +.311 for labor returns per man-equivalent (appendix II, tables 1 and 5). This agrees with results in other countries.

TABLE 23. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF CROP INDEX

2866 farms in 17 regions, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients o variability
North China				
Anhwei				
Hwaiyuan	100±1.39	94±1.74	22.88±0.98	22.88±1.03
Su	100±1.34	107±1.68	33.60±0.95	33.60±1.05
Chihli				
Pingsiang	100±1.88	103±2.36	34.42±1.33	34.42±1.48
Yenshan (1922)	100±1.25	100±1.57	22.66±0.88	22.66±0.93
Yenshan (1923)	100±2.10	87±2.63	35.92±1.49	35.92±1.67
Honan				
Sincheng	100±0.69	102±0.86	12.29±0.49	12.29±0.50
Kaifeng	100±0.79	101±0.99	14.37±0.56	14.37±0.57
Shansi				
Wusiang	100±0.25	101±0.31	5.83±0.18	5.83±0.18
Wutai	100±0.49	99±0.61	11.00±0.35	11.00±0.35
Average by localities	*100*	*101*	*21.44*	*21.44*
East Central China				
Anhwei				
Laian (1921)	100±1.61	99±2.02	24.01±1.14	24.01±1.20
Laian (1922)	100±1.67	102±2.09	24.81±1.18	24.81±1.25
Wuhu	100±0.84	103±1.05	12.52±0.59	12.52±0.60
Chekiang				
Chinhai	100±0.37	100±0.46	4.47±0.26	4.47±0.26
Fukien				
Lienkiang	100±0.79	98±0.99	14.86±0.56	14.86±0.57
Kiangsu				
Kiangning (S)	100±0.34	97±0.43	7.28±0.24	7.28±0.25
Kiangning (T)	100±1.11	98±1.39	24.19±0.78	24.19±0.83
Wuchin	100±0.47	98±0.59	12.16±0.33	12.16±0.34
Average by localities	*100*	*99*	*15.54*	*15.54*
Average by 17 localities	*100*	*100*	*18.66*	*18.66*

*Theoretically these means and medians should be 100, since the average yield of all the farms in each locality is taken as 100. They are not, because the numbers are average of averages rather than weighted averages.

Value of land per hectare.—Land values omitting buildings and trees are a measure of the quality of business to the extent that they reflect differences in productivity of the various size-groups of farms. The average of such values as represented

by the mean is $620 compared with the median of $520 (table 24). Land values are not very variable, as is shown by the average coefficient of variability of 23.43 per cent (table 24).

Land values average $626 for farms in the small size-group, $623 in the medium size-group, and $612 in the large size-group, showing only a two per cent difference in smaller

TABLE 24. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF VALUE OF LAND PER HECTARE

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	214.57± 3.24	204.18± 4.06	53.46± 2.29	24.91±1.13
Su	357.72± 4.37	368.73± 5.48	109.62± 3.09	30.64±0.94
Chihli				
Pingsiang	621.29±17.57	520.16±22.02	321.25±12.43	51.71±2.48
Yenshan (1922)	235.08± 3.89	243.37± 4.88	70.60± 2.75	30.03±1.27
Yenshan (1923)	337.26± 8.60	344.07±10.78	147.02± 6.09	43.59±2.12
Honan				
Sincheng	640.95± 5.22	669.20± 6.54	92.92± 3.69	14.50±0.59
Kaifeng	533.77± 1.65	551.34± 2.07	29.81± 1.17	5.58±0.22
Shansi				
Wusiang	332.31± 3.00	316.95± 3.76	70.36± 2.12	21.17±0.67
Wutai	222.49± 1.45	223.46± 1.82	32.22± 1.02	14.48±0.47
Average by localities	*388.38*	*344.07*	*103.03*	*26.29*
East Central China				
Anhwei				
Laian (1921)	381.66± 4.86	362.45± 6.09	72.49± 3.44	18.99±0.93
Laian (1922)	392.90± 5.47	362.45± 6.86	81.01± 3.86	20.62±1.03
Wuhu	1655.89±17.83	1482.58±22.35	266.86±12.60	16.12±0.78
Chekiang				
Chinhai	890.36±28.93	1073.57±36.26	351.10±20.47	39.43±2.63
Fukien				
Lienkiang	1701.38±20.97	1673.36±26.28	394.12±14.82	23.16±0.92
Kiangsu				
Kiangning (S)	746.65± 4.21	738.06± 5.28	88.97± 2.98	11.92±0.41
Kiangning (T)	633.43± 5.91	610.79± 7.41	129.08± 4.18	20.38±0.69
Wuchin	644.59± 2.76	640.13± 3.46	70.97± 1.95	11.01±0.31
Average by localities	*880.86*	*689.10*	*181.83*	*20.20*
Average by 17 localities	*620.14*	*520.16*	*140.11*	*23.43*

value for farms in the large size-group (table 25). The values in East Central China are practically the same for the two extreme size-groups, whereas in North China they are over six per cent lower for farms in the large size-group. In four localities the values are greater for farms in the large size-group, while for all others, values are greater for farms in the small size-group. One may conclude that the difference in land values for size of farm is not very great but because of the better land in the small farms values are naturally a little higher in this group.

Not only do land values have little relation to size of farm but little also to profits. In ten localities operator's labor

TABLE 25. RELATION OF SIZE OF FARM TO LAND VALUE PER HECTARE

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Land value per hectare for farms grouped by size of farm						Ratios of land value per hectare for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$241	$195	$214	$196	$215	$215	100	81	89	81	89
Su	405	...	358	...	304	358	100	...	88	...	75
Chihli											
Pingsiang	672	...	604	...	592	621	100	...	90	...	88
Yenshan (1922)	259	220	...	243	225	235	100	85	...	94	87
Yenshan (1923)	312	...	331	...	370	337	100	...	106	...	119
Honan											
Sincheng	665	637	...	631	620	641	100	96	...	95	93
Kaifeng	548	537	...	525	527	534	100	98	...	96	96
Shansi											
Wusiang	317	322	324	339	366	332	100	101	102	107	115
Wutai	245	224	226	206	269	222	100	91	92	84	85
Average by localities	*407*	...	*332**	...	*331*	*333*	*100*	...	*94*	...	*94*
East Central China											
Anhwei											
Laian (1921)	409	375	...	376	371	382	100	92	...	92	91
Laian (1922)	412	...	394	...	372	393	100	...	96	...	90
Wuhu	1685	1660	...	1720	1572	1656	100	99	...	102	93
Chekiang											
Chinhai	820	...	860	...	1001	890	100	...	105	...	122
Fukien											
Lienkiang	1509	...	1829	...	1777	1701	100	...	121	...	118
Kiangsu											
Kiangning (S)	749	760	...	738	740	747	100	101	...	99	99
Kiangning (T)	760	670	582	611	580	633	100	88	77	80	76
Wuchin	639	658	654	645	567	645	100	103	102	101	89
Average by localities	*873*	...	*895**	...	*873*	*881*	*100*	...	*103*	...	*100*
Average by 17 localities	*626*	...	*623**	...	*612*	*620*	*100*	...	*100*	...	*98*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

earnings decrease as land values increase but show a low association. The average gross correlation coefficients of the eleven localities is –.177 (appendix II, tables 1 and 3). Only one locality has a marked association.

Receipts per hectare.—Receipts per hectare (crop area) amount to $221 in the small size-group, $197 in the medium size-group, and $172 in the large size-group, showing that the receipts between the extreme size-groups are lower by twenty per cent for farms in the large size-group (table 26). The sources of receipts by size of farm were not studied. The relationship may possibly be largely accounted for by products

TABLE 26. RELATION OF SIZE OF FARM TO FARM RECEIPTS PER HECTARE (CROP AREA)

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Farm receipts per hectare for farms grouped by size of farm						Ratios of farm receipts per hectare for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$61.84	$57.59	$52.83	$54.83	$55.71	$55.83	100	93	85	89	90
Su	109.62	...	94.81	...	58.73	70.13	100	...	86	...	54
Chihli											
Pingsiang	179.28	...	140.03	...	133.84	140.74	100	...	78	...	75
Yenshan (1922)	107.13	94.13	...	89.92	87.94	91.16	100	88	...	84	82
Yenshan (1923)	37.40	...	41.49	...	40.62	40.50	100	...	111	...	109
Honan											
Sincheng	139.80	124.61	...	113.85	118.44	121.45	100	89	...	81	85
Kaifeng	192.97	153.00	...	144.56	132.84	142.53	100	79	...	75	69
Shansi											
Wusiang	92.95	90.95	83.58	87.57	85.11	86.50	100	98	90	94	92
Wutai	74.27	71.69	71.69	66.70	68.15	69.60	100	97	97	90	92
Average by localities	*110.58*	...	*94.27**	...	*86.82*	*90.97*	*100*	...	*85**	...	*79*
East Central China											
Anhwei											
Laian (1921)	224.54	193.91	...	186.66	173.98	186.48	100	86	...	83	77
Laian (1922)	257.88	...	170.35	...	122.51	154.22	100	...	66	...	48
Wuhu	302.30	270.57	...	277.24	279.91	277.54	100	90	...	92	93
Chekiang											
Chinhai	330.35	...	327.64	...	311.52	319.82	100	...	99	...	94
Fukien											
Lienkiang	758.58	...	775.16	...	531.64	610.09	100	...	102	...	70
Kiangsu											
Kiangning (S)	357.62	266.91	...	253.49	244.23	259.66	100	75	...	71	68
Kiangning (T)	217.65	180.09	146.14	154.17	138.59	154.34	100	83	67	71	64
Wuchin	317.28	338.02	345.53	339.27	334.54	337.74	100	107	109	107	105
Average by localities	*345.78*	...	*311.69**	...	*267.12*	*287.49*	*100*	...	*90*	...	*77*
Average by 17 localities	*221.26*	...	*196.58**	...	*171.66*	*183.45*	*100*	...	*89*	...	*78*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

of a higher value per hectare being raised on the small farms. A comparison of crop yields on small and large farms shows only a very slight difference of three per cent in favor of the small farms and is caused chiefly by the better quality of land on such farms. The relationship is practically the same for both North and East Central China.

Expenses per hectare.—The average farm expenses per hectare (crop area) for farms in the small size-group is $71.12 compared with $67.80 in the medium size-group and with $65.00 in the large size-group (table 27). It is evident, therefore, that the expenses are a little higher per hectare for the small farms.

TABLE 27. RELATION OF SIZE OF FARM TO FARM EXPENSES PER HECTARE (CROP AREA)

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FARM EXPENSES PER HECTARE FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF FARM EXPENSES PER HECTARE FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$51.08	$38.31	$29.92	$28.42	$31.55	$32.92	100	75	59	56	62
Su	41.14	...	25.44	...	18.48	21.65	100	...	62	...	45
Chihli											
Pingsiang	29.70	...	34.12	...	39.96	37.31	100	...	115	...	135
Yenshan (1922)	30.84	28.86	...	35.55	41.00	36.41	100	94	...	115	133
Yenshan (1923)	16.35	...	22.42	...	23.04	22.17	100	...	137	...	141
Honan											
Sincheng	44.74	36.13	...	34.13	21.94	31.83	100	81	...	76	49
Kaifeng	42.04	24.81	...	29.46	33.43	31.01	100	59	...	70	80
Shansi											
Wusiang	11.83	14.29	17.67	19.51	29.19	22.12	100	121	149	165	247
Wutai	23.04	16.27	13.53	13.05	10.15	13.53	100	71	59	57	44
Average by localities	*32.31*	...	*26.64**	...	*27.64*	*27.66*	*100*	...	*82*	...	*86*
East Central China											
Anhwei											
Laian)1921)	122.33	97.32	...	88.62	87.35	93.15	100	80	...	72	71
Laian (1922)	193.19	...	117.62	...	72.13	101.30	100	...	61	...	37
Wuhu	101.85	112.08	...	115.94	123.05	117.42	100	110	...	114	121
Chekiang											
Chinhai	87.78	...	92.72	...	116.66	104.21	100	...	106	...	133
Fukien											
Lienkiang	172.54	...	201.73	...	120.71	144.29	100	...	117	...	70
Kiangsu											
Kiangning (S)	42.54	34.08	...	54.88	65.62	55.69	100	80	...	129	154
Kiangning (T)	119.57	101.69	82.01	84.47	78.40	86.27	100	85	69	71	66
Wuchin	78.49	138.32	165.60	184.94	192.32	156.28	100	176	211	236	245
Average by localities	*114.79*	...	*114.11**	...	*107.03*	*107.33*	*100*	...	*99*	...	*93*
Average by 17 localities	*71.12*	...	*67.80**	...	*65.00*	*65.15*	*100*	...	*95*	...	*91*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

Comparing the extreme size-groups, in North China they are fourteen per cent higher, but in East Central China they are nearly the same. When comparing localities, however, the relationship is extremely variable, since nine localities have higher expenses for farms in the small size-group, while eight localities have higher expenses for farms in the large size-group.

Size of Farm in Relation to Capital Efficiency

Capital investment in buildings per hectare.—Less capital per hectare (crop area) is required on large farms than on small farms, as is shown by the value of such capital, which amounts

TABLE 28. RELATION OF SIZE OF FARM TO CAPITAL INVESTMENT PER HECTARE IN BUILDINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Capital investment in buildings per hectare for farms grouped by size of farm						Ratios of capital per hectare in buildings for different size-groups to the small size-group				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$66.35	$41.06	$30.92	$29.54	$35.43	$36.43	100	62	47	45	53
Su	33.80	...	20.13	...	15.70	17.97	100	...	60	...	46
Chihli											
Pingsiang	245.05	...	157.36	...	148.51	161.60	100	...	64	...	61
Yenshan (1922)	163.86	111.96	...	98.59	74.31	93.51	100	68	...	60	45
Yenshan (1923)	65.89	...	49.42	...	41.37	46.69	100	...	75	...	63
Honan											
Sincheng	57.50	44.74	...	61.66	57.36	54.78	100	78	...	107	100
Kaifeng	70.47	79.08	...	84.60	75.12	78.05	100	112	...	120	107
Shansi											
Wusiang	88.49	68.67	60.22	58.38	81.12	71.29	100	78	68	66	92
Wutai	45.59	37.86	33.51	33.19	31.90	34.64	100	83	74	73	70
Average by localities	*93.00*	...	*66.25**	...	*62.31*	*66.11*	*100*	...	*71*	...	*67*
East Central China											
Anhwei											
Laian (1921)	133.56	89.34	...	88.80	73.21	86.44	100	67	...	66	55
Laian (1922)	189.74	...	129.03	...	75.57	106.74	100	...	68	117	88
Wuhu	170.94	73.68	...	199.70	150.19	135.06	100	43	...	117	88
Chekiang											
Chinhai	392.91	...	363.23	...	298.44	335.14	100	...	92	...	76
Fukien											
Lienkiang	589.31	...	572.26	...	235.11	348.12	100	...	97	...	40
Kiangsu											
Kiangning (S)	301.26	234.43	...	209.47	213.77	223.70	100	78	...	70	71
Kiangning (T)	77.58	56.26	41.99	44.28	59.87	52.48	100	73	54	57	77
Wuchin	401.61	311.58	285.28	250.35	253.97	292.65	100	78	71	62	63
Average by localities	*282.11*	...	*227.74**	...	*170.02*	*197.54*	*100*	...	*81*	...	*60*
Average by 17 localities	*181.99*	...	*142.25**	...	*113.00*	*127.96*	*100*	...	*78*	...	*62*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

to $182 for farms in the small size-group, $142 for farms in the medium size-group, and $113 for farms in the large size-group (table 28). The reason for this is that the same size of buildings will meet requirements, within limits, of additional amounts of land.

Capital investment in implements per hectare.—The capital investment in implements and equipment per hectare (crop area) shows in eight localities greater efficiency in the use of capital on large farms (table 29). The borrowing of tools by farmers on small farms from the large farms makes it im-

TABLE 29. RELATION OF SIZE OF FARM TO CAPITAL INVESTMENT PER HECTARE IN IMPLEMENTS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	CAPITAL INVESTMENTS PER HECTARE IN IMPLEMENTS FOR FARMS GROUPED BY SIZE OF FARM						RATIOS OF CAPITAL PER HECTARE IN IMPLEMENTS FOR DIFFERENT SIZE-GROUPS TO THE SMALL SIZE-GROUP				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	$5.38	$10.02	$10.39	$6.51	$6.76	$7.51	100	186	193	121	126
Su	10.00	...	13.16	...	8.10	9.37	100	...	132	...	81
Chihli											
Pingsiang	7.78	...	6.72	...	10.96	9.55	100	...	86	...	141
Yenshan (1922)	5.82	7.31	...	8.79	10.03	8.92	100	126	...	151	172
Yenshan (1923)	5.20	...	8.55	...	13.25	11.15	100	...	164	...	255
Honan											
Sincheng	7.31	11.04	...	13.77	10.18	11.04	100	151	...	188	139
Kaifeng	14.30	16.02	...	16.37	15.68	15.85	100	112	...	114	110
Shansi											
Wusiang	7.99	7.07	7.07	7.53	7.22	7.22	100	88	88	94	90
Wutai	3.06	2.26	1.45	1.13	0.97	1.45	100	74	47	37	32
Average by localities	*7.43*	...	*9.15**	...	*9.24*	*9.12*	*100*	...	*123*	...	*124*
East Central China											
Anhwei											
Laian (1921)	19.03	13.77	...	13.05	13.05	13.77	100	72	...	69	69
Laian (1922)	19.75	...	18.85	...	12.87	15.77	100	...	95	...	65
Wuhu	76.06	57.52	...	69.98	41.07	52.63	100	76	...	92	54
Chekiang											
Chinhai	55.70	...	65.27	...	70.06	65.91	100	...	117	...	126
Fukien											
Lienkiang	96.19	...	110.44	...	39.69	61.41	100	...	115	...	41
Kiangsu											
Kiangning (S)	36.63	37.98	...	40.39	39.72	39.32	100	104	...	110	108
Kiangning (T)	17.88	18.04	17.71	18.21	15.75	17.22	100	101	99	102	88
Wuchin	25.19	60.53	54.27	53.30	41.61	50.51	100	240	215	212	165
Average by localities	*43.30*	...	*47.90**	...	*34.23*	*39.57*	*100*	...	*111*	...	*79*
Average by 17 localities	*24.31*	...	*27.39**	...	*21.00*	*23.45*	*100*	...	*113*	...	*86*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

possible to draw conclusions on investment of capital in tools except that, if a farmer is to own his tools, then a large farm is preferable to a small one.

THE BEST SIZE OF FARM

The family-sized farm is usually considered the most economic unit. This size is, of course, variable, but in general it is such as to permit the farm work being done by the operator and the members of the farm family with some additional hired help. For the seventeen localities the amount of this additional hired help is equivalent to approximately one-half a man giving full time to farm work. For the United States, where the family-size farm is also prevalent, the amount of hired labor in addition to family labor is a little less than the equivalent of one-half a man.

The studies made of the relation of size of farm to profits, labor efficiency, quality of business, and to capital efficiency, show that the farms in the large size-groups are in most instances the most profitable. In other words, the best size of farm is above the lower limit of the class interval used for the large size-group (tables 2 and 3). The median size of these farms is 3.51 hectares (farm area) and the range of medians between localities is 1.37 to 14.71 hectares (farm area). If the localities with exceptionally large farms, Wutai Hsien, Shansi and Su Hsien, Anhwei, are omitted, then the upper limit of this range is a median of 6.57 hectares. Naturally the best size of farm will vary according to the size of the family, the kinds of crops grown, and the productivity of the soil. For instance, the two studies at Yenshan Hsien, Chihli, were made in different types of soil, the one for 1923 being made farther east where the soil is more alkaline and hence larger farms are necessary in order to give the farm family a living. The median size of the farms of the two sections of Yenshan is 1.53 and 2.91 hectares. At Su Hsien, Anhwei, the farmers realize the advantage of large farms in using men, animals, and equipment efficiently and there is a saying that for a farm of 100 to 125 mow three men, three animals, one plow, one harrow, and one cart are used to maximum capacity, but that for a farm of 200 to 250 mow proportionately less labor and equipment is required, and, on such size of farms five men, five animals, two plows, two harrows, and one cart are enough.

SIGNIFICANCE OF THE PRESENT SIZE OF FARM BUSINESS.

Since farms in the largest size-groups are usually the most profitable, as the various measures of profits show, the question arises, why are the farms not larger? It would seem that if an increased size of farm gives greater returns, farmers would have larger farms. The over-supply of farmers is the answer. Other occupations in which farmers can engage are so limited that the farm land has to be divided according to the farm population. Each succeeding generation of sons, upon inheriting land from their fathers, can testify to a size of holding diminishing with each redivision. The result is a farm smaller than the best economic unit for profits. It is one of the most irrefutable proofs of over-population and this situation is further discused in the chapter on the farm family and population under the topics of size of farm and size of family and density of population. The solution of this problem of a farm business too small even for the most profitable economic unit has several important aspects, some of which even relate to large national problems.

REMEDIES FOR THE SMALL SIZE OF FARM BUSINESS.

There are several ways by which the present size of the farm business in China may be made larger, but such progress is conditioned by the existence of a stable government which can maintain peace and order throughout the country districts.

The amount of cultivated land may be increased by the reclamation and colonization of some lands now too wet or too dry, by removal or concentration of graves, cremation, and by cultivating arable land still uncultivated. If population remained stationary, then benefit would accrue to those who remain on their present farms, as well as to those who settled the new lands, because of the decreased density of population.

The transfer of farmers to other occupations, such as transportation, industries, and professions is much to be desired, because it would decrease the farm population and thereby increase the farm land per capita of farm population, thus making possible a higher standard of living for those who continue to farm, providing, of course, that the vacancies left by the emigrants were not rapidly filled by an increasing population.

Intensive farming, which consists of the use of more labor and capital accompanied by farm credit, transportation, and marketing facilities, is one of the most promising ways of increasing the size of the farm business. To accomplish this practices such as the following must be adopted:—

1. More thorough preparation and cultivation of the soil
2. The use of more fertilizers
3. More and better irrigation and drainage
4. The control of insects and diseases
5. The breeding and propagation of better crop plants
6. The breeding of better animals
7. The growing of crops which will bring greater food production per unit of land, or greater money return. Among these may be mentioned fruits, tubers, and fiber crops.
8. The economic management of the farm business in such a way that the same or greater receipts may be obtained with less expenditure or more wise expenditure of capital and labor.

Most of these practices depend either upon the use of more labor or more capital or both. In some cases the use of capital may be indirect, such as taxation of farmers for agricultural experiment stations.

The absence of reasonable farm credit has been one of the chief factors impeding the progress of Chinese agriculture. An adequate and dependable transportation system is equally important, since without it land cannot be put to its most advantageous use. To illustrate, mountain sides of Central Chekiang, Western Anhwei, and Northern Shansi are shorn of their forests for farming purposes. The timber is worth little because of high transportation costs. Moreover, food stuffs cannot be brought in for the same reason; yet food must be had at any cost and that cost is the erosion of mountain sides wrongly used for farming and the filling of streams channels, resulting in the consequent flooding of productive level lands.

CHAPTER V.

FARM OWNERSHIP AND TENANCY

Farm tenancy in China presents a problem of varying magnitude with each locality. In some sections all farmers are owners and in others nearly all are tenants. While a special treatment of tenancy was not contemplated in the schedule used for these studies, nevertheless details of a year's farm business on part owner and tenant as well as on owner farms give opportunity for analysis on the basis of ownership. Comparisons are made in all localities having twenty or more farms for two or more types of tenure, and include a total of 2542 farms in fifteen localities.

EXTENT OF TENANCY

From a geographic standpoint, farm tenancy is well distributed, since only two out of seventeen localities have nearly all owner farms. Tenant farms in six localities constitute over 20 per cent of all farms (table 1). Over three-fourths of the farmers in North China are owners, but less than one-half in the East Central China localities; owners average 63 per cent for all of the 2866 farms studied. Part owners operate one-ninth and tenants one-tenth of all farms in North China. In East Central China part owners are found on one-fifth and tenants on one-third of the farms. For all farms studied one-sixth are part owner and one-fifth tenant farms. These percentages may only approximately represent the true distribution of ownership. The farms were selected at random with the idea of including tenant and part owner as well as owner farms, but it is quite possible that in some localities the percentage for one type or the other is greater or less. However, it is probable from this and other data (1), (2), that owner farms constitute from one-half to three-fifths, and part owners and tenants one-fifth to one-fourth each of all farms in China.

TABLE 1. LAND TENURE

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NUMBER OF OPERATORS			PER CENT OF OPERATORS		
	Owners	Part owners	Tenants	Owners	Part owners	Tenants
North China						
Anhwei						
Hwaiyuan	105	18	1	84.7	14.5	0.8
Su	166	63	57	58.0	22.0	20.0
Chihli						
Pingsiang	128	22	2	84.2	14.5	1.3
Yenshan (1922)	150	...	...	100.0	...	...
Yenshan (1923)	129	3	1	97.0	2.3	0.7
Honan						
Sincheng	94	44	6	65.3	30.5	4.2
Kaifeng	116	33	...	77.9	22.1	...
Shansi						
Wusiang	205	38	8	81.7	15.1	3.2
Wutai	90	...	136	39.8	...	60.2
Total	1,183	221	211	...	...	...
Average by localities	...	...	...	*76.5*	*13.4*	*10.1*
East Central China						
Anhwei						
Laian (1921)	46	4	51	45.5	4.0	50.5
Laian (1922)	73	6	21	73.0	6.0	21.0
Wuhu	56	33	13	54.9	32.4	12.7
Chekiang						
Chinhai	1	15	51	1.5	22.4	76.1
Lienkiang	72	67	22	44.7	41.6	13.7
Kiangsu						
Kiangning (S)	128	60	15	63.0	29.6	7.4
Kiangning (T)	66	46	105	30.4	21.2	48.4
Wuchin	217	40	43	72.3	13.4	14.3
Fukien						
Total	659	271	321	...	...	...
Average by localities	...	...	...	*48.2*	*21.3*	*30.5*
Total, 17 localities	1,842	492	532	...	...	...
Average by 17 localities	...	...	...	*63.2*	*17.1*	*19.7*

RENTING SYSTEMS.

There are three types of renting systems on the part owner and tenant farms (table 2). Of these, the most usual is the cash crop system, where a definite amount of grain by measure is given as rent each year, sometimes the grain itself being taken as rent and sometimes the money value of the grain. Share rent is more frequent than the cash crop system of rent at Su Hsien, Anhwei, and Sincheng Hsien, Honan. At Chinhai Hsien, Chekiang, share rent and cash crop rent are equally important. Of all the farms studied only those in Kiangning Hsien (T), Kiangsu, used to any marked degree the cash rent system, and even then cash crop rent was twice as common. At Wutai Hsien, Shansi, the cropper system is prevalent. The landlord furnishes everything in this system except the labor and hand tools. The tenant is the manager, however, although he may be advised by the landlord.

A very great variation occurs in share-tenancy contracts between landlords and tenants in different parts of the country and smaller variations appear even in the same region. At Su Hsien, where the "half and half" system prevails, about two-thirds of the landlords furnish seeds to the tenants in addition to land and buildings. Before the crops are divided on the threshing floor in the presence of the landlord or his representative the equivalent of the amount of seed given the tenant is returned to the landlord. The threshed grain and the stalks of crops not used for feed or fodder, such as part of the barley, wheat straw, and sweet potato vines, are then divided equally. However, about one-third of the landlords do not require the tenants to return the equivalent of the seeds furnished. About one-third of the landlords furnish fertilizers in addition to land, buildings, and seeds, and the cost is divided equally between the two parties, but the tenant is not required to pay his share until harvest time. In exceptional cases a tenant will find a landlord willing to furnish him with labor animals, but most landlords prefer not to do this, for it is a left-over of earlier days when land was plentiful and tenants few. The "half and half" system is probably the most common in North China and varies chiefly in whether or not the landlord furnishes seeds, fertilizers, and, in some cases, buildings.

TABLE 2. TYPES OF RENTING SYSTEMS AND PROPORTION OF TOTAL RECEIPTS GIVEN TO THE LANDLORD

641 farms, 11 localities, six provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	TYPES OF TENURE	TYPES OF RENT (NUMBER OF FARMS)					PER CENT OF TOTAL RECEIPTS TAKEN BY LANDLORD*
		Share	Cash crop	Share and cash	Cash	Cash and cash crop	
North China							
Anhwei							
Su	Tenant	54	3	..	..	..	51.4†
	Part owner	30	32	..	1	..	50.0
Honan							
Sincheng ..	Part owner	28	16	..	..	..	50.0
Kaifeng.. ..	Part owner	..	33	..	..	..	30.0
Shansi							
Wutai	Tenant	..	136	..	..	..	66.6
East Central China							
Anhwei							
Laian (1921).	Tenant	..	51	..	..	..	46.4
Laian (1922).	Tenant	..	21	..	..	..	36.7
Chekiang							
Chinhai	Tenant	16	18	17	..	..	27.0
Fukien							
Lienkiang ..	Tenant	..	22	..	..	..	40.2
Kiangsu							
Kiangning (S)	Tenant	..	15	..	..	..	24.6
Kiangning (T)	Tenant	4	60	..	33	8	40.6
Wuchin	Tenant	..	42	..	1	..	32.4
Average by 11 localities..	..	..	..	..	..	..	*40.5*

*Calculated from actual farm receipts for these farms.

†This figure is remarkably close to that of 50 per cent reported by these same farmers.

In the share rent system at Ta Tsou Chuang, Hsinghwa Hsien, Kiangsu, the landlord furnishes land, windmill, irrigation pump, one half of the seed and fertilizer, and in exceptionally wet or dry years one-half of the labor for irrigation and drainage. As rent the tenant gives the landlord one-half the grain and straw from wheat and rice land, two-fifths of the grain and straw from rice land only, and three-tenths of the grain and straw from poor land. It is here, as well as in many other places, that an attempt is made to adjust the proportion of rent to the fertility or type of land and to the kind of crops grown. In all cases the seed used in planting is taken out of the harvested crop and is given to the landlord before dividing. As soon as the grain is threshed the tenant invites the landlord to a feast,

after which the grain is divided and the tenant delivers the landlord's share to his home. After it is properly delivered the landlord gives the tenant a feast. If the landlord wishes to dismiss the tenant he does so at this time. If the tenant wishes to leave, he takes the sails from the windmill just before the landlord comes to the tenant's feast as a sign to the landlord of his intentions.

In Laian Hsien, Anhwei, where the share "half and half" system prevails, the absentee landlords send their agents, or go themselves, to the fields and estimate the yield of the crop and the share given by the tenant is based on this estimate. Such men are very expert in approximating the true yield. It is also quite customary for the landlords to grant the tenants free use of a moderate sized field for the purpose of growing cotton for the tenant's family.

Percentage of Receipts Given to Landlord

The percentage of receipts given to the landlord has been computed from that part of the schedule giving the total farm receipts and showing the share given the landlord. The percentage of total receipts for the landlord varies from 24.6 per cent in Kiangning Hsien (S), Kiangsu, where small rents are demanded, to 66.6 per cent at Wutai Hsien, Shansi, where the cropper system prevails and where the landlord furnishes everything but labor and routine management (table 2). It is interesting that these percentages in Wutai Hsien should be exactly two-thirds of the total for practically every individual farm. The causes of variation between the different places are many and may receive conscious or unconscious consideration; that is, rents may be determined by such factors as custom, value of land, quality of land, kind of crops grown, intensiveness of methods used, reduction granted for years of low yields, amounts of capital supplied by the landlord, and the importance of land ownership to the landlord as a means of maintaining social prestige.

Collection of Rent

Rent is collected chiefly in two ways; the tenant takes the grain or cash to the landlord's house, or the landlord sends his agent to collect from the tenant. In North China, the rent is usually taken to the landlord by the tenant. In East Central

China, information is available for only Kiangning Hsien (T), Kiangsu, and Wuhu Hsien, Anhwei, and in these places the rent may be collected either by the landlord or by his agent. Whenever two crops a year are grown on the same piece of land rents are usually collected twice a year, once at the time of spring harvests and the other at the time of autumn harvests. Division of share rent usually takes place in the presence of the landlord or his agent. In the cash-tenancy system the tenant often tries to cheat the landlord by reporting a crop yield lower than it is in order to obtain a reduction in rent, while in share-tenancy he very commonly cheats by skilfully hiding some of the threshed grain before division takes place and also by giving the landlord inferior crops. On the other hand, the landlord or his agent often uses a large measure. When the agent collects rent the tenant has to treat the agent very well and often has to bribe him in order to keep the land for cultivation another year.

COMPARISONS OF ECONOMIC CONDITIONS AMONG OWNERS, PART OWNERS, AND TENANTS

In making a comparison of owner, part owner, and tenant farms, it is essential that it be between owners and tenants, or owners and part owners, or part owners and tenants of the same locality. For instance, tenants of one region cannot be compared with owners in another because of the possible difference in conditions. The complete data appear in table 3.

Size of Business

Size of farm.—For the regions studied, one may conclude that there is no clear-cut distinction in size of the farm between owners, part-owners, and tenants. In eleven localities, five have approximately the same size of farms for part owners as for owners, while four other localities have larger and two much smaller owner farms. For the eight localities having both tenant and owner farms in significant numbers, four have much larger tenant, three much smaller tenant than owner, and one about the same size of farms for both. Comparing tenant and part owner farms for six localities, four have part owner larger than tenant farms, one has part owner much smaller than tenant farms, and one nearly the same size. In Su Hsien, Anhwei,

TABLE 3. A COMPARISON OF IMPORTANT ECONOMIC FACTORS AMONG DIFFERENT TYPES OF LAND TENURE

2583 farms, 15 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	SIZE OF BUSINESS						PROFITS														
	SIZE OF FARM (FARM AREA IN LOCAL MOW)			SIZE OF FAMILY (ADULT-MALE UNITS)			OPERATOR'S LABOR EARNINGS			FARM LABOR EARNINGS			FAMILY EARNINGS PER ADULT-MALE UNIT			LABOR RETURNS PER MAN-EQUIVALENT			NET PROFITS PER CROP MOW (LOCAL)		
	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants
North China																					
Anhwei																					
Hwaiyuan	45.9	48.2	...	3.95	3.97	...	$-2.09	$10.02	$ ...	$-2.00	$ 8.00	$ ...	$40.37	$40.52	$ ...	$32.90	$40.39	$ ...	$-1.64	$-0.47	$ ...
Su	56.2	40.5	98.1	5.03	4.99	5.74	84.33	36.20	82.50	84.33	40.16	62.94	63.35	33.54	29.15	84.68	60.99	76.63	0.57	0.59	0.26
Chihli																					
Pingsiang	20.1	22.1	...	3.51	2.92	...	25.71	38.17	...	25.71	35.27	...	36.92	42.28	...	38.53	47.51	...	-0.99	0.18	...
Honan																					
Sincheng	42.3	41.7	...	5.36	5.45	...	74.58	88.39	...	74.58	74.94	...	71.81	54.16	...	48.75	42.95	...	0.76	0.79	...
Kaifeng	50.3	82.0	...	5.46	6.69	...	140.44	294.44	...	140.44	296.50	...	65.53	77.97	...	95.03	124.60	...	0.88	1.62	...
Shansi																					
Wusiang	28.9	28.5	...	3.42	3.58	...	48.38	71.55	...	48.38	66.17	...	48.53	42.75	...	61.68	75.02	...	-0.47	0.05	...
Wutai	62.1	...	181.2	...	...	...	103.15	...	111.95	103.15	...	392.91	...	...	...	76.44	...	74.72	0.78	...	1.89
East Central China																					
Anhwei																					
Laian (1921)	74.7	...	75.5	4.77	...	4.06	23.37	...	233.79	23.37	...	350.57	98.27	...	118.00	65.59	...	108.03	-0.84	...	2.79
Laian (1922)	40.0	...	58.2	4.42	...	4.83	6.14	...	55.27	6.14	...	13.38	85.69	...	54.24	60.64	...	64.86	-1.61	...	-1.44
Wuhu	19.6	37.9	...	3.80	5.15	...	-16.85	155.46	...	-16.85	73.87	...	77.36	96.10	...	42.79	90.32	...	-2.93	-0.47	...
Fukien																					
Lienkiang	27.6	20.1	21.0	3.90	4.09	3.69	281.85	250.87	200.22	281.85	300.23	256.10	112.57	104.52	97.91	201.36	207.92	202.03	5.96	5.61	7.92
Chekiang																					
Chinhai	...	33.7	16.6	...	4.57	3.54	...	148.73	126.77	...	138.84	132.62	...	57.98	58.13	...	112.55	113.95	...	0.95	2.04
Kiangsu																					
Kiangning (S)	31.5	28.5	20.1	4.33	4.29	3.73	258.43	240.35	283.04	258.43	233.63	273.71	129.15	90.29	97.03	182.90	189.99	229.92	4.19	3.38	5.40
Kiangning (T)	43.5	41.0	30.2	5.65	5.02	4.20	-6.48	43.00	70.52	-6.48	22.67	33.60	59.20	60.02	47.91	43.30	63.33	70.25	-2.03	-0.69	-0.62
Wuchin	18.6	18.1	16.7	3.61	4.16	3.94	75.66	104.46	139.17	75.66	114.62	151.60	75.74	51.13	52.92	147.05	148.12	176.94	2.13	2.69	3.54
Average (owners and tenants)*	...	...	...	*4.53*	...	*4.31*	*103.31*	...	*147.06*	*103.31*	...	*191.85*	*89.14*	...	*71.02*	*107.75*	...	*125.42*	...	...	..
Average (part owners and tenants)*	...	...	...	...	*4.52*	*4.14*	...	*137.27*	*105.37*	...	*141.69*	*151.76*	...	*66.25*	*63.84*	...	*130.48*	*144.95*	...	...	..
Average (owners and part owners)*	...	...	...	*4.37*	*4.57*	...	*87.63*	*121.17*	...	*87.63*	*115.10*	...	*70.96*	*63.03*	...	*89.00*	*99.19*	...	...	...	...

*These averages are only for localities having both types of the specified tenure. Averages are omitted for data given in local mow.

TABLE 3—*(Continued)*

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	QUALITY OF THE BUSINESS						LABOR EFFICIENCY					
	VALUE OF LAND (FARM AREA IN LOCAL MOW)			CROP INDEX			CAPITAL INVESTED IN BUILDINGS PER FARM			CROP MOW (LOCAL) PER MAN		
	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants
North China												
Anhwei												
Hwaiyuan	$17.10	$17.59	$...	100.3	105.6	...	$137.97	$110.50	$ ...	29.2	31.7	...
Su	29.56	27.80	24.98	117.9	103.9	92.1	111.37	60.63	44.93	44.4	39.1	67.2
Chihli												
Pingsiang	35.21	34.16	...	97.0	104.0	...	200.05	112.39	...	20.1	17.1	...
Honan												
Sincheng	44.07	47.14	...	100.6	104.2	...	154.91	168.27	...	22.3	16.3	...
Kaifeng	31.26	29.98	...	103.0	100.3	...	247.28	303.64	...	34.9	42.0	...
Shansi												
Wusiang	21.85	21.09	...	100.0	99.0	...	141.21	94.83	...	23.1	25.0	...
Wutai	14.51	...	13.35	100.1	...	100.1	161.56	...	370.84	28.6	...	60.5
East Central China												
Anhwei												
Laian (1921)	21.62	...	20.35	83.8	...	113.7	358.04	...	366.27	15.7	...	20.7
Laian (1922)	22.00	...	20.95	107.5	...	102.9	290.68	...	220.95	16.8	...	18.3
Wuhu	115.59	103.75	...	101.8	102.2	...	271.25	222.27	...	12.4	16.3	...
Fukien												
Lienkiang	70.20	75.89	72.43	95.8	99.4	102.9	290.86	428.30	314.77	12.9	14.5	13.1
Chekiang												
Chinhai	...	67.80	51.72	...	98.5	100.4	...	720.00	351.57	...	14.4	12.1
Kiangsu												
Kiangning (S)	54.89	55.66	62.01	97.6	99.2	117.5	555.39	407.50	342.00	30.7	34.2	28.7
Kiangning (T)	37.14	38.83	39.47	97.1	99.3	102.7	177.16	113.48	80.72	12.2	14.9	14.4
Wuchin	45.55	45.84	50.61	98.2	91.0	103.0	432.71	367.00	157.56	25.8	28.2	28.4
Average by localities (owners and tenants)*	...	...	...	*99.8*	...	*104.4*	*297.22*	...	*237.26*	...	...	...
Average by localities (part owners and tenants)*	...	...	...	...	*98.6*	*103.1*	...	*349.49*	*215.26*	...	..	...
Average by localities (owners and part owners)*	...	...	...	*100.8*	*100.7*	...	*247.29*	*217.16*	...	...	..	...

*These averages are only for localities having both types of the specified tenure. Averages are omitted for data given in local mow.

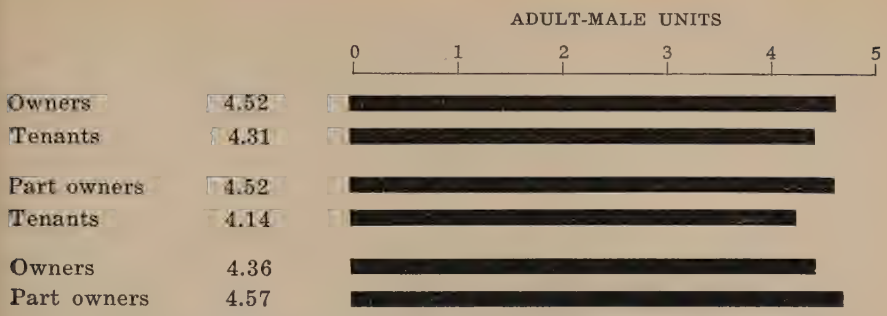

Fig. 1.—A comparison of size of family (adult-male units) by types of land tenure.
2542 farms, 15 localities, seven provinces, China, (1921-1925).

most of the tenants are on the larger farms, although there are also nearly the same proportion of owners as tenants in the largest size-group of farms. Evidently, no outstanding relationship exists between size of farm and type of tenure.

Size of family (adult-male units).—The size of family for the different types of land tenure has been reduced to the adult-male unit basis for the purpose of more accurate comparison and it is seen that the variation in average size of family is not very great, although tenant families are a little smaller than those of either the owner or part owner (fig. 1).

Profits

Operator's labor-earnings.—Operator's labor earnings are much less for owners than for tenants; for part owners than for tenants, and for owners than for part owners (fig. 2). Apparently, from the business standpoint where interest is

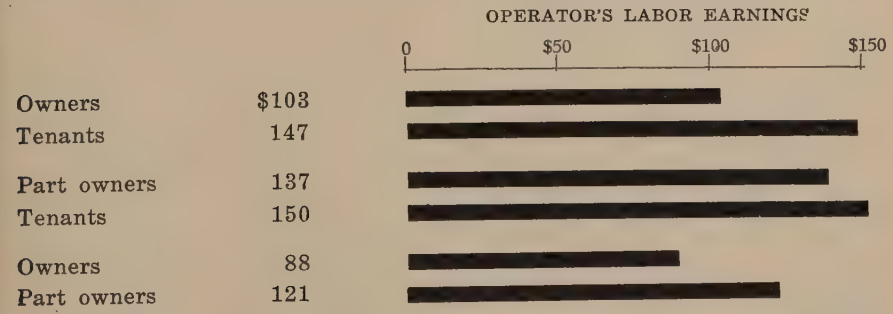

Fig. 2.—A comparison of operator's labor earnings by types of land tenure.
2542 farm, 15 localities, seven provinces, China, (1921-25).

charged on investment there is some advantage in being a tenant, but the real advantage is the owner's in that he saves a yearly rent payment, which is about equivalent to interest on capital investment in land and buildings, cost of taxes, and up-keep of the farm, plus the landlord's profit.

Farm labor earnings.—Farm labor earnings for the different classes of land tenure show somewhat higher returns for tenants and part owners than for owners, than is true for operator's labor earnings. This fact is made more clear in comparing tenants' operator labor earnings with tenants' farm labor earnings, the latter being 86 per cent greater than the former (fig. 3). This is caused in part by the exceptionally

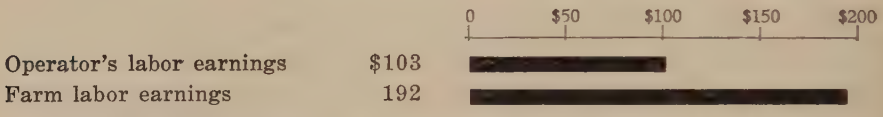

Fig. 3.—A comparison of operator's labor earnings and farm labor earnings on tenant farms.

1594 farms, eight localities, four provinces, China, (1921-1925).

If tenants owned the land they farm and if they continued to farm as well as at present their labor earnings would be 86 per cent greater.

large farm labor earnings for tenants at Wutai Hsien, Shansi, where the cropper system is prevalent, and in part by the greater industry of the tenants.

Apparently, if the tenants owned the land farmed at present and *if they farmed as well as now* and if they were able to work without the supervision from landlords given in some localities, they would be better off financially than even the owners.

Family earnings per adult-male unit.—Family earnings per adult-male unit are decidedly greater for the owner than for the part owner or the tenant farms (fig. 4). The actual difference between the owner and tenant farms is $18.12, in favor of the owner. In other words, an adult-male unit in tenant families has one-fifth less income than in the owner family. The average difference of part owners and owners is $8.84 in favor of the former, while of part owners and tenants it is $2.41 per adult-male equivalent in favor of the part owner.

The comparison of family earnings per adult-male unit between tenants and owners of the same localities bears out the general impression that the tenant farmer is not so well off as the owner farmer. Probably the reason for this in China is not

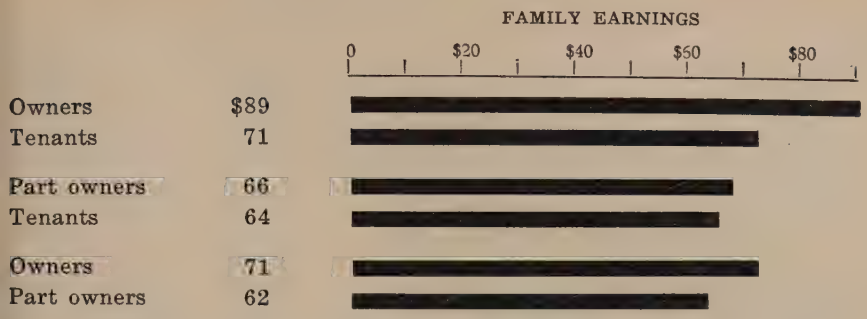

Fig. 4.—A comparison of family earnings per adult-male unit by types of land tenure.
2316 farms, 15 localities, seven provinces, China, (1921-1925).

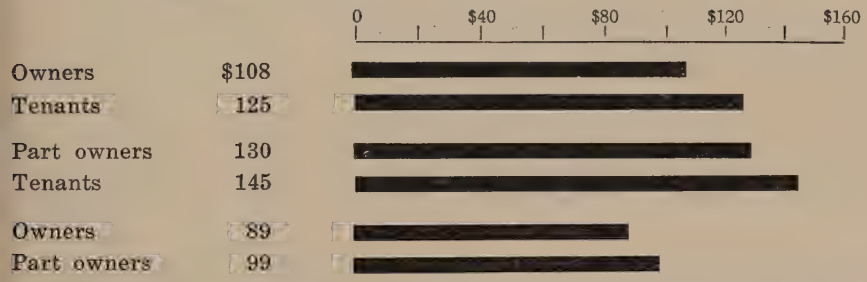

Fig. 5.—A comparison of labor returns per man-equivalent by types of tenure.
2542 farms, 15 localities, seven provinces, China, (1921-1925).

primarily because of inferior ability on the part of the tenant, but because of his smaller amount of inherited property. Ninety per cent of the land for the 2370 out of the 2866 farms has been inherited. The acquiring of land by a poor young man, except by inheritance, is a difficult task because of low wages, or low profits from farming. For this reason, it would not be fair to assume that the tenants do not deserve a higher income because of supposed inferior ability to that of the owner. Such a condition may exist in certain localities or in countries where land is fairly easily acquired, but in China there are plenty of instances where the tenant works harder and farms better than the owner farmer and the data presented in this chapter are confirmation.

Labor returns per man-equivalent.—Since size of farm is similar on the average for different types of tenure, a comparison may be made of labor returns per man-equivalent by classes of

land tenure. Tenant and part owner farms give somewhat larger returns per man-equivalent than do owner farms (fig. 5). An extreme example occurs at Kiangning Hsien (S), Kiangsu, where such returns are one-fourth greater from tenant farms, which are one-third smaller than the owner farms. In general, the men working on tenant or part owner farms earn more than those on owner farms.

Net profits per crop mow.—In seven out of eight localities, tenants received higher net profits per local crop mow than owners, and in seven out of eleven localities part owners' profits were higher than owners', while in four out of six localities tenants' profits exceeded those of the part owners. It is significant that tenant farms have larger net profits per crop mow and this must be due to better management, unless such profits are derived at the expense of the maintenance of soil fertility. Since in most regions tenants cultivate the same piece of land for life, it is not likely that the larger profits for the tenant are due to the robbing of the land. This, of course, does not hold true for all places in China, but may be considered a general rule. An exception is found at Hsinghwa, Kiangsu, where there is a proverb, "Every time a tenant moves three are made poor, the landlord, the tenant, and the land," (換佃三家窮).

Quality of the Business

Value of land per local mow (farm area).—The value of land for the three types of tenure in most cases varies only a few dollars. There are only two outstanding exceptions, the one in Chinhai Hsien, Chekiang, where the values are 24 per cent less for tenants than for owners, and the other in Su Hsien, Anhwei, where the values are 15 per cent less for tenants than for owners.

Crop index.—Contrary to the prevailing opinion that tenants do not farm as well as owners, a classification according to yields by different types of tenure shows no significant variation in yields for most localities, and for the few in which a difference does occur, it is in favor of the tenant or part owner as often as for the owner (fig. 6). An exception occurs in Su Hsien, Anhwei, where the crop index for tenant farms is 22 per cent lower than for owner farms and is largely because most of the tenants are on the larger farms, where the land is of inferior quality.

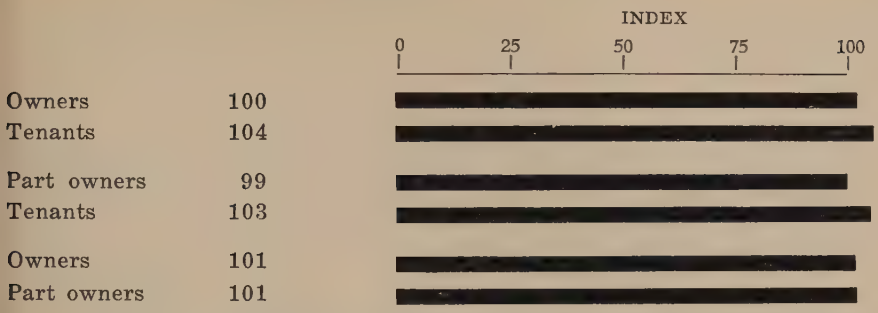

Fig. 6.—A comparison of yields (crop index) by types of land tenure. 2542 farms, 15 localities, seven provinces, China, (1921-1925).

Capital investment in buildings.—Tenants have buildings of one-fifth less value than those of owners and of nearly two-fifths less value than those of part owners (table 3). This lower value of buildings is a common relationship in other countries and apparently the condition in China is similar to that elsewhere, in that landlords do not provide good buildings for tenants.

Labor efficiency.—Labor efficiency may be measured to some extent by the number of crop mow per man. For most localities where the size of farms are the same for the three types of tenure, no significant difference occurs. A few localities do show a tendency for greater efficiency on tenant farms as measured by the number of crop mow per man and since in these particular localities the size of the farm is even smaller, it is probably a measure of greater labor efficiency.

These comparisons of what might be called efficiency factors in the measurement of the difference in the efficiency of the farm business on farms of different types of tenure show that the tenants, in general, are better farmers than the owners. The reason why the profits, such as family earnings, are higher for owners is because the owners have more property and, therefore, obtain the income from such property, whereas if these same owners had to pay rent or interest on the value of their property, they would be receiving even smaller incomes than the tenants. Apparently, tenant farming for the places studied does not mean inefficient farming. In some places, even, it is evident that the tenants farm better than the owners. This is not strange because very often farmers who have inherited property but have little education do not feel the need of exerting

themselves for a living and naturally farm less well than tenants who have to do their utmost in order to make a living.

LANDLORDS' PROFITS

Landlords' profits are best measured by determining the interest obtained on the capital investment. This is done by subtracting the landlord's expenses from his receipts. Expenses are chiefly taxes and upkeep of the farm, but also often include expenditure for seed, fertilizer, or other items. Such profits are then divided by the total capital investment which for these farms gives an annual interest rate of 8.5 per cent for the land rented to part owner and tenant farmers (table 4). A comparison of interest rates on rented land to part owners

TABLE 4. THE INTEREST RECEIVED BY THE LANDLORD FOR HIS INVESTMENT

2583 farms, 15 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	LANDLORD'S ANNUAL INTEREST FROM CAPITAL INVESTMENT		
	Part owners	Tenants	Part owners and tenants
North China			
Anhwei			
Hwaiyuan	9.1	...	9.1
Su	8.9	7.6	8.3
Chihli			
Pingsiang	6.0	...	6.0
Honan			
Sincheng	6.3	...	6.3
Kaifeng	8.2	...	8.2
Shansi			
Wusiang	7.4	...	7.4
Wutai	...	17.3	17.3
East Central China			
Anhwei			
Laian (1921)	...	14.1	14.1
Laian (1922)	...	5.5	5.5
Wuhu	2.6	...	2.6
Fukien			
Lienkiang	11.8	10.8	11.3
Chekiang			
Chinhai	7.4	10.9	9.2
Kiangsu			
Kiangning (S)	7.3	7.2	7.3
Kiangning (T)	4.8	4.6	4.7
Wuchin	10.5	9.3	9.9
Average by localities	*8.5**	*8.4**	*8.5*

*These averages are only for localities having both types of the specified tenure.

and to tenants shows no significant difference between the two.

Interest rates on loans to farmers are usually not lower than 20-30 per cent and more often, are higher. Comparing the landlord's return upon his capital investment with these rates it appears that the landlord is not receiving an exorbitant rate. However, investment in land is usually comparatively safe. This, combined with the fact that ownership of land often is desired primarily for the social prestige it brings, accounts, in part, for the willingness of landlords to accept these returns for his investment, his time expended in management, and his risks. Variation in the landlord's returns depends upon the importance of these factors in the different localities and ranges from 2.6 per cent in Wuhu Hsien, Anhwei, where cash rent and cash crop rent prevail, to 17.8 per cent in Wutai Hsien, Shansi, where the landlords supply everything but labor. Special conditions of land ownership in Wuhu Hsien account for the landlord's low return upon his investment. It is customary for farmers, when in need of money, to sell their land to landlords below its real value. In return the seller is given the right of permanent cultivation and only a small rent payment is required. Another factor making the return to the landlord small is the high valuation of the land, because possession of it gives social prestige. For this reason the landlord cannot justly expect the tenant to pay rent to the extent of the average percentage return upon landlord's investment for localities where such conditions do not prevail.

The variations in the landlord's proportion of investment, risk, and extent of management naturally cause the landlord's returns to differ between localities or even between individual farms. However, the average interest rate of 8.5 per cent per annum for landlords appears to be too high in the light of the later discussion of a fair rent and for this reason probably should be reduced.

A FAIR RENT AND ACTUAL RENTS

The attention of the National Government in China in its rural work has been directed partly toward the farm tenant problem, and the question of a fair rent payment by the tenant has received some consideration. The problem of determining a fair rent is by no means an easy one. Probably there is no perfect method, but the one herein suggested is presented with

the hope that it will be tried and a more perfect one devised. In this discussion, it is assumed that society admits that the landlord is entitled to a fair income from his capital investment in his land and buildings, and that the tenant is also entitled to a reasonable reward for his labor.

Method of determining fair rent.—The method of determining fair rent is on the principle of division of total farm receipts between the landlord and tenant in the same proportion that expenses occur for both. But this is not as simple as it sounds. If all expenses were in cash the method would be an easy one, but some items do not involve cash transactions. Such are the return for interest on the landlord's capital and the reward for the tenant's labor and his managing ability. The landlord, if he sold his land, could take the capital and invest it in some other enterprise from which interest could be obtained. At the present time there are not sufficient data in hand to indicate the exact rate of interest that a landlord should receive for his capital investment. Compared with most other investments it should be low because of its high margin of safety. In this study of fair rents an arbitrary rate of five per cent has been used. Such a rate makes it possible to raise the family earnings of the tenant which, as already shown, are lower than those of owner farms and which hardly supply the minimum needs of the family. A definite rate of interest takes care of changes in land values in that rising values would return a higher amount. But such changing values should only be used if prices are also rising or falling.

Landlords who share rent their land and thus assume greater risk and more management responsibilities, should be allowed a rate higher than that for landlords who use cash rent. In this study no differentiation has been made. Share rent occurred only at Su Hsien, Anhwei, to any significant extent.

The value at which land should be estimated is also another factor of considerable importance. In some regions land has a higher value than it is worth for farming purposes because of the benefit gained by the owner in social prestige. An approximate value for such land may be reached by not allowing an estimated capitalization of net receipts to exceed 10 per cent of the total value of the land. For example, land ordinarily selling at $100 per mow and yielding net receipts of only $5.00 per mow should not be valued for more than $50.00 per mow

and perhaps it should be estimated even lower. This method could well be used in years of poor crops or crop failures. In such years land capitalized at 10 per cent of the value of the crops would have a very small hypothetical value. This rightly would give the landlord only a meagre return and would force him to share the loss with the farmer. In this study the suggested adjustment has been made wherever net receipts are less than 10 per cent of the land value.

The value of the tenant's labor is determined by a comparison with the cost of labor of similar character. The fact that one tenant farmer may work more diligently and longer hours than another is provided for by the fundamental principle of the division of receipts in the same proportion that farm expenses occur. The farmer who works more has a larger labor bill to enter in the expense account. This increases his proportion of expenses and therefore automatically he receives a larger share of the receipts. Strictly speaking, an amount should also be added to cover the managerial ability of the tenant. The value of such ability may be estimated by taking the farmer's own valuation of the manual and managing work he does. Some farmers may estimate a little too high and some a little too low, but the average of many farmers will give a number near the actual one. The value of managerial ability is small in China when compared with other countries having large farms, but still it is an item which should be measured and counted as one of the tenant's expenses. It has not been so estimated here because the original data only include information upon value of manual work done.

Upon the present basis of social organization, the exact rate of interest which the landlord should have and the exact amount of return the tenant should receive for his labor must be determined by the principle of bargaining. Just as capital and labor bargain as to the wage rate, so must the landlord and the farm tenant bargain as to the amount of rent to be paid. The amount will, of course, vary largely with the supply and demand of land and with the number of farmers to till it.

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[1] The Peking Government standard was used in this analysis before the National Government issued its new regulations. Since the comparisons are chiefly in percentages the data have not been converted into the metric system. The calculations are for farm area.

TABLE 5. AMOUNT OF FARM EXPENSES PER MOW* FOR LANDLORD AND TENANTS

501 tenant farms, nine localities, five provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	EXPENSES										TOTAL OF CASH AND NON-CASH EXPENSES.			AVERAGE CAPITAL INVESTMENT PER MOW (farm area)	
	CASH		NON-CASH												
			Landlord			Tenant									
	Landlord	Tenant	Decrease of capital	Interest on capital at 5 per cent†	Total	Family labor	Decrease of capital	Interest on capital at 10 per cent‡	Value of tenant's labor	Total	Landlord	Tenant	Total	Landlord	Tenant
North China															
Anhwei															
Su	$0.40	$0.30	$...	$0.90	$0.90	$0.34	$0.15	$0.13	$0.19	$0.81	$1.30	$1.11	$2.41	$18.54	$1.33
Shansi															
Wutai	0.11	0.31	0.02	0.81	0.83	0.29	...	...	0.28	0.57	0.94	0.88	1.82	16.27	0.01
East Central China															
Anhwei															
Laina (1921)	0.92	1.44	...	1.39	1.39	2.84	0.35	0.43	1.21	4.83	2.31	6.27	7.87	27.79	4.26
Laian (1922)	0.81	1.12	...	0.79	0.79	3.40	0.15	0.44	1.40	5.39	1.60	6.51	8.77	28.24	4.41
Chekiang															
Chinhai	0.21	3.98	...	2.53	2.53	0.99	0.07	2.66	4.97	8.69	2.74	12.67	15.41	50.66	26.60
Fukien															
Lienkiang	0.36	2.58	...	5.20	5.20	6.18	0.19	3.43	4.38	14.18	5.56	16.76	22.32	103.93	34.30
Kiangsu															
Kiangning (S)	0.27	1.65	...	2.53	2.53	0.75	0.52	2.09	2.46	5.82	2.80	7.47	10.27	50.63	20.87
Kiangning (T)	0.22	1.31	...	0.94	0.94	3.45	0.20	0.60	2.17	6.42	1.16	7.73	8.89	38.06	5.96
Wuchin	0.68	4.68	0.01	2.26	2.27	1.38	1.45	1.66	3.84	8.33	2.95	13.01	15.96	45.16	16.61
Average by localities	*0.44*	*1.93*	—	*1.93*	*1.93*	*2.18*	*0.35*	*1.27*	*23.2*	*6.12*	*2.37*	*8.05*	*10.42*	*42.14*	*12.71*

*Peking standard mow (farm area).

†For the localities in Su Hsien, Laian Hsien (1922) and Kiangning Hsien (T), an adjustment, as explained in the text, has been made, making these values $18.00, $15.85, and $18.86 respectively for the purpose of computing the interest on the landlord's capital.

‡A higher rate of interest is charged for the tenant's capital because it is working capital.

TABLE 6. AMOUNT OF FARM EXPENSES PER MOW* FOR LANDLORD AND TENANTS

501 tenant farms, nine localities, five provinces, China (1921-1924)

Provinces and hsiens in which studies were made	Receipts: Cash: Landlord: Crops and livestock	Cash: Landlord: Cash rent	Cash: Landlord: Total	Cash: Tenant: Crops and livestock	Non-cash: Landlord: Products used by the family	Non-cash: Landlord: Increase of capital	Non-cash: Landlord: Total	Non-cash: Tenant: Products used by the family	Non-cash: Tenant: Increase of capital	Non-cash: Tenant: Total	Total of cash and non-cash receipts: Landlord	Total of cash and non-cash receipts: Tenant	Total receipts per mow*	Net receipts† per mow*	Value of land per mow*	Percentage that net receipts are to value of land per mow*
North China																
Anhwei																
Su	$1.73	$...	$1.73	$0.55	$...	$...	$...	$0.96	$0.03	$0.99	$1.73	$1.54	$3.27	$1.76	$18.14	9.7
Shansi																
Wutai	1.69	...	1.69	0.80	1.18	0.10	1.28	0.42	...	0.42	2.97	1.22	4.19	3.18	13.13	24.2
East Central China																
Anhwei																
Laian (1921)	4.86	...	4.86	4.72	...	...	...	3.63	0.07	3.70	4.86	8.42	13.28	6.09	22.29	27.3
Laian (1922)	2.26	...	2.26	3.22	...	...	...	2.72	0.14	2.86	2.26	6.08	8.34	1.02	22.59	4.5
Chekiang																
Chinhai	3.20	0.74	3.94	12.38	...	0.70	0.70	2.17	0.12	2.29	4.64	14.67	19.31	6.43	49.79	12.9
Fukien																
Lienkiang	8.40	...	8.40	16.27	4.10	...	4.10	7.99	1.13	9.12	12.50	25.39	37.89	20.77	103.93	20.0
Kiangsu																
Kiangning (S)	3.39	...	3.39	11.69	0.55	...	0.55	4.45	0.08	4.53	3.94	16.22	20.16	12.42	50.63	24.5
Kiangning (T)	1.56	0.47	2.03	5.12	...	...	...	2.63	0.04	2.67	2.03	7.79	9.82	1.87	37.87	4.9
Wuchin	4.94	....	4.94	7.42	...	...	...	8.19	0.35	8.54	4.94	15.96	20.90	7.20	43.19	16.7
Average by localities	*3.56*	*0.13*	*3.69*	*6.91*	*0.65*	*0.09*	*0.74*	*3.68*	*0.22*	*3.90*	*4.43*	*10.81*	*15.24*	*6.75*	*40.17*	*16.1*

*Peking standard mow (farm area).

†These receipts are computed without including interest on the landlord's capital as an expense, for the purpose of determining the percentage that net receipts are to value of land per mow.

Actual rent paid compared with a fair rent.—In nine localities enough tenant farmers were found to make a special study of rent payments, numbering a total of 501 farms. The receipts and expenses for these farms have been computed on a per mow[1] basis and the cash and non-cash receipts and expenses have been classified separately (tables 5 and 6). From this the percentage of receipts and expenses for the landlord and tenant has been obtained (table 7). This information makes it possible

TABLE 7. PERCENTAGE OF FARM EXPENSES AND FARM RECEIPTS FOR LANDLORDS AND TENANTS

501 tenant farms, nine localities, five provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FARM EXPENSES						FARM RECEIPTS					
	CASH		NON-CASH		CASH AND NON-CASH		CASH		NON-CASH		CASH AND NON-CASH	
	Land-lord	Ten-ant	Land-lord	Ten-ant	Land-lord	Ten-ant	Land-lord	Ten-ant	Land-lord	Ten-ant	Land-lord	Ten-ant
North China												
Anhwei												
Su	57.1	42.9	52.6	47.4	53.9	46.1	75.9	24.1	...	100.0	52.9	47.1
Shansi												
Wutai	26.2	73.8	59.3	40.7	51.6	48.4	67.9	32.1	75.3	24.7	70.9	29.1
East Central China												
Anhwei												
Laian (1921)..	39.0	61.0	12.8	87.2	19.7	80.3	50.7	49.3	...	100.0	36.6	63.4
Laian (1922)..	42.0	58.0	17.0	83.0	16.7	83.3	41.2	58.8	...	100.0	27.1	72.9
Chekiang												
Chinhai	5.0	95.0	22.5	77.5	17.8	82.2	24.1	75.9	23.4	76.6	24.0	76.0
Fukien												
Lienkiang ..	12.2	87.8	26.8	73.2	24.9	75.1	34.0	66.0	31.0	69.0	33.0	67.0
Kiangsu												
Kiangning (S)	14.1	85.9	30.3	69.7	27.3	72.7	22.5	77.5	10.8	89.2	19.5	80.5
Kiangning (T)	14.4	85.6	12.8	87.2	13.0	87.0	28.4	71.6	...	100.0	20.7	79.3
Wuchin	12.7	87.3	21.4	78.6	18.5	81.5	40.0	60.0	...	100.0	23.6	76.4
Average	*18.6*	*81.4*	*24.0*	*76.0*	*22.7*	*77.3*	*34.8*	*65.2*	*15.9*	*84.1*	*29.1*	*70.9*

to determine what per cent of total receipts the tenant is receiving above or below the amount he should receive on the basis of dividing receipts in proportion to expenses (table 8). The percentages average minus 6.4 for all nine localities and vary between localities from minus 19.3, where the tenant is receiving too small a share of the receipts, to plus 7.8, where the tenant is receiving too large a share of the receipts.

After finding that the tenant is receiving of the total receipts 6.4 per cent too little, the percentage reduction in rent required for a fair rent may be obtained by multiplying 6.4 per cent by the total receipts, $15.24. This gives 98 cents as the additional amount that should be received by the tenant for each mow of land farmed. The total rent paid by the tenant is represented

TABLE 8. RENT PER MOW* PAID BY THE TENANT AND THE ESTIMATED FAIR RENT

501 tenant farms, nine localities, five provinces, China (1921-1924)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Number of per cent of tenant's receipts to total farm receipts is greater or less than the percentage of tenant's expenses is to total farm expenses	Rent per mow* paid to landlord by tenant	Increase or decrease in tenant's rent per mow* required for fair rent	Amount of rent the tenant should pay per mow*	Per cent increase or reduction required for a fair rent payment by the tenant
North China					
Anhwei					
Su	1.0	$1.73	$0.03	$1.76	1.7
Shansi					
Wutai	–19.3	2.87	–0.81	2.06	–28.2
East Central China					
Anhwei					
Laian (1921)	–9.7	4.86	–1.29	3.57	–26.5
Laian (1922)	–7.4	2.26	–0.62	1.64	–27.4
Chekiang					
Chinhai	–6.2	4.64	–1.20	3.44	–25.9
Fukien					
Lienkiang	–8.1	12.50	–3.07	9.43	–24.6
Kiangsu					
Kiangning (S)	7.8	3.94	1.57	5.51	39.8
Kiangning (T)	–7.7	2.03	–0.76	1.27	–37.4
Wuchin	–5.1	4.94	–1.07	3.87	–21.7
Average	*–6.4*	*4.43*	*–0.98*	*3.45*	*–22.1*

*Peking standard mow (farm area).

by the landlord's receipts, less increase in landlord's capital. It varies from $1.73 per mow to $12.50 per mow and averages $4.43. For a fair rent the amount should be $4.43 less $0.98 cents or $3.45. This represents a reduction of 22.1 per cent required in order to make the present rents fair on the principle of dividing receipts in proportion to expenses. If managerial ability of the tenant had been included as an expense, the percentage reduction would have been slightly larger. That the percentage reduction required is not the same for all regions is shown by the great variation between regions of a 37.4 per cent reduction required for Chinhai Hsien, Chekiang, to an increase in rent of 39.8 per cent that should be paid by the tenant at Kiangning (S), Kiangsu.

The reasons for such variations are not the same, but in general they may be attributed to lenient or unjust landlords. For instance, at Kiangning Hsien (S), Kiangsu, many of the landlords or members of their families are merchants in the big port cities and they are not dependent on their holdings for a living. Such land is kept as a family heritage and for the social prestige it brings; consequently, the tenant profits from the low rent demanded.

The important point is that adjustment should be made according to the practice and conditions of each locality.

That rents should be reduced is shown not only by the division of receipts in proportion to expenses incurred, but by the fact that, as already mentioned, family earnings per adult-male unit are one-fifth less for tenants than for owners in the same localities. An adjustment of this kind would make a higher standard of living possible for the tenant and thus prevent too unequal and too unjust a distribution of wealth by its concentration into the hands of landlords.

In closing this chapter it is suggested that fair rents be determined in each locality upon the basis of a knowledge of conditions peculiar to it. Data pertaining to the farm business can be obtained in sufficient detail, either by the survey method such as was used in this study, or by the keeping of farm accounts. A haphazard determination of rents on any other basis may be unjust to tenant or landlord.

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CHAPTER VI

CROPS

CROPPING SYSTEMS

There are several marked differences between cropping systems in China and in the West. In China there is, for one thing, a much larger amount of double cropping, averaging 50 per cent of the total crop area for the localities studied. Nearly all of these crops are planted after the winter crops, but in some localities not studied there are exceptions to this; in Central and South China, for instance, two crops of rice are grown during the same season. This double cropping is made possible by the long growing season and by the use of crops maturing before the autumn frosts.

A second difference is that in China crops are grown primarily for their grain, fiber, or leaf products. There are of course exceptions to this in green manure crops, such as *Astragalus sinensis*, a vetch, grown in the rice regions of East Central China, and alfalfa, grown in North China as fodder for labor animals. But the statement may be made as a general principle, and that there is no animal industry as it is known in the West is the reason. Outside of Mongolia and Tibet dairying is unknown except for recently introduced herds near port cities and in a few interior places. Since there is no real animal industry, there is little place in the cropping systems for hay or pasture. The Chinese farmer raises his crops for direct human utilization rather than for animals and animal products designed for human consumption. By-products of crops, such as stalks and straw, are used for fuel, as fodder for labor animals, and for building or other industrial purposes.

A third difference in the cropping systems of China and the West is that in China these systems must provide for the fuel supply of the farm population and a large proportion of the city population as well. This fact has a direct relation to

the maintenance of soil fertility in two ways; first, less organic matter is thereby restored to the soil, and second, less manure is used on crops than would be the case if stalks were fed to a larger number of animals.

The cropping systems are often quite elastic. For example, in those localities where wheat or rice is the cash crop, these are planted year after year until the harvests are too meager to give adequate returns. In the case of wheat when yields become too low kaoliang or millet, either of which is a manured and well-tilled crop, is then introduced into the system; in the case of rice, when it ceases to produce well *Astragalus sinensis* is often planted.

TABLE 1. CROPPING SYSTEMS[1]

2866 farms, 17 localities, seven provinces, China (1921-25)

North China Localities

Hwaiyuan Hsien, Anhwei.

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
Low	1	1st	Rice	.....
„	2	1st	Wheat	Rice
		2nd	Kaoliang	.....
		3rd	Rice	.....
„	3	1st	Thatching grass	.....
		2nd	Thatching grass	.....
		3rd	Thatching grass	....
		4th	Fallow	.....
		5th	Wheat	Rice
„	4*	1st	Barley	Soybeans and sesame
		2nd	Wheat and field peas	Rice
High	5*	1st	Wheat	Soybeans
		2nd	Wheat and field peas	Sesame or soybeans
„	6	1st	Kaoliang	Green beans
		2nd	Barley	Green beans
„	7	1st	Cotton	.....
„	8*	1st	Wheat	Soybeans
		2nd	Wheat	Sesame
		3rd	Kaoliang	.....
High	9	1st	Kaoliang	.....
		2nd	Peanuts	.....
		3rd	Wheat	Watermelons

1. Crops planted in association are those with the word "and" between them; for instance, "wheat and field peas."
Soybeans are chiefly the yellow soybeans used largely for oil and beancurd.

TABLE 1.—*(Continued)*

Su Hsien, Anhwei.

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
High	1*†	1st	Wheat	Soybeans
		2nd	Wheat	Soybeans
		3rd	Wheat	Soybeans
		4th	Kaoliang	....
„	2*	1st	Wheat	Soybeans
		2nd	Kaoliang	....
„	3‡	1st	Wheat	Soybeans
„	4	1st	Wheat	Sesame
		2nd	Wheat	Soybeans
„	5	1st	Wheat and field peas	Soybeans
„	6	1st	Barley	Sweet potatoes
„	7	1st	Wheat	Sweet potatoes
		2nd	Cotton	....
		3rd	Barley	Red beans
„	8*	1st	Wheat and field peas	Sweet potatoes
		2nd	Wheat	Soybeans
		3rd	Squash and corn	....
„	9	1st	Wheat	Soybeans
		2nd	Watermelon	Winter radish
Medium	10	1st	Barley	Soybeans
„	11	1st	Barley	.....
„	12	1st	Wheat	Millet
		2nd	Wheat and field peas	Sesame
„	13	1st	Wheat and field peas	Soybeans
		2nd	Sesame	.....
		3rd	Barley	Green beans
		4th	Proso millet	.....
„	14	1st	Wheat and field peas	Soybeans
		2nd	Kaoliang	.....
„	15	1st	Barley	Green beans
		2nd	Sesame	.....
		3rd	Wheat	Carrots
		4th	Barley	Sesame
„	16*	1st	Wheat and field peas	Greens beans
		2nd	Kaoliang	.....
		3rd	Barley	Soybeans
		4th	Proso millet	.....
„	17	1st	Wheat	Tobacco
		2nd	Barley	Cowpeas
		3rd	Wheat	Buckwheat
		4th	Vegetables	Vegetables
Medium	18	1st	Barley	Soybeans
		2nd	Peanuts	.....
		3rd	Barley	Soybeans
		4th	Millet	.....

TABLE 1.—*(Continued)*

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
Medium	19	1st	Tobacco	.....
Low	20	1st	Wheat	Green beans
„	21	1st	Wheat and field peas	Small beans
		2nd	Wheat	Green beans
		3rd	Barley	Soybeans
		Pingsiang Hsien, Chihli		
Low	1†	1st	Wheat	Millet
		2nd	Hemp	Vegetables
„	2	1st	Wheat	Cabbage
		2nd	Hemp	Vegetables
„	3	1st	Wheat	Onions
		2nd	Wheat	Cabbage
„	4†	1st	Wheat	.....
„	5	1st	Wheat	Millet
„	6	1st	Wheat	Hemp
„	7	1st	Kaoliang	.....
		2nd	Soybeans	.....
		3rd	Kaoliang	.....
		4th	Kaoliang	.....
		5th	Soybeans	.....
Low	8*†	1st	Kaoliang	.....
		2nd	Soybeans	.....
„	9†	1st	Kaoliang	.....
„	10†	1st	Kaoliang and soybeans	.....
		2nd	Millet and soybeans	.....
„	11†	1st	Barley	Vegetables
„	12†	1st	Wheat	Cabbage
„	13	1st	Wheat	Indigo
		2nd	Wheat	Cabbage
„	14	1st	Wheat	Tobacco
„	15	1st	Watermelons or muskmelons	.....
		2nd	Wheat	Millet
		3rd	Wheat	Cabbage
„	16	1st	Wheat	Corn
„	17†	1st	Wheat	Soybeans
		2nd	Wheat	Millet
		Yenshan Hsien (1922), Chihli		
High and medium	1*†	1st	Wheat	Soybeans and corn
		2nd	Kaoliang or millet	.....
„	2†	1st	Wheat	Corn
		2nd	Wheat	Corn and soybeans
		3rd	Kaoliang or millet	.....
High and medium	3	1st	Wheat	Soybeans and millet
		2nd	Kaoliang or millet	.....
		3rd	Wheat	Corn

TABLE 1.—*(Continued)*

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
Low	4	1st	Wheat	.....
		Yenshan Hsien (1923), Chihli		
High	1†	1st	Wheat	Corn and soybeans
		2nd	Kaoliang or millet	.....
High and medium	2†*	1st	Wheat	Soybeans
		2nd	Kaoliang or millet	.....
		3rd	Wheat	Corn and soybeans
High, medium and low	3	1st	Wheat	Proso millet and soybeans
		2nd	Kaoliang or millet	.....
„	4	1st	China jute	.....
		2nd	Kaoliang or China jute	.....
		3rd	China jute	.....
		4th and several years,	Alfalfa	.....
Low	5	1st	Wheat	.....
		Sincheng Hsien, Honan		
High	1*	1st	Wheat	Soybeans
		2nd	Kaoliang	.....
		3rd	Wheat	Millet
„	2	1st	Wheat	.....
		2nd	Wheat	Millet
„	3	1st	Wheat	Sesame and green beans
		2nd	Corn (early)	.....
		3rd	Wheat	Buckwheat
		4th	Millet	.....
„	4	1st	Wheat	Millet and green beans
„	5	1st	Wheat	Soybeans
		2nd	Melons	.....
		3rd	Wheat	Millet
		4th	Wheat	Sesame and green beans
„	6	1st	Wheat	Corn
„	7	1st	Wheat	Taro
„	8	1st	Wheat	Sesame
„	9*	1st	Wheat	Buckwheat
		2nd	Kaoliang	.....
		3rd	Wheat	.....
„	10	1st	Wheat	Soybeans or buckwheat
		2nd	Sesame or green beans	.....

TABLE 1.—*(Continued)*

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
Medium	11	1st	Wheat	Soybeans
		2nd	Melons	.....
		3rd	Wheat	Millet
		4th	Wheat	Sesame and green beans
,,	12	1st	Rapeseed	Millet
		2nd	Wheat	Soybeans
		3rd	Kaoliang	.....
		4th	Wheat	.....
		5th	Wheat	Buckwheat or rapeseed

Kaifeng Hsien, Honan

The cropping systems for Kaifeng Hsien, are, in general, quite similar to those of Sincheng Hsien, Honan, and Su Hsien, Anhwei.

Wusiang Hsien, Shansi

High	1	1st	Wheat	.....
		2nd	Wheat	.....
		3rd	Wheat	.....
		4th	Wheat	.....
		5th	Wheat	Soybeans[1], or buckwheat and winter radishes
		6th	Kaoliang, or millet, or soybeans and rapeseed	.....
Low	2†	1st	Kaoliang and soybeans	.....
		2nd	Millet with green beans at the border sometimes	.....
		3rd	Soybeans and rapeseed	.....
,,	3	1st	Wheat	.....
		2nd	Wheat	.....
		3rd	Wheat	.....
		4th	Wheat	.....
		5th	Wheat	.....
		6th	Wheat	Soybeans[1]
		7th	Kaoliang or millet	.....
,,	4*	1st	Squash, corn and lima beans	.....
		2nd	Squash, corn and lima beans	.....
		3rd	Irish potatoes	.....
		4th	Irish potatoes	.....
		5th	Wheat and field peas	.....

1 A small kernel and short season variety.

TABLE 1.—*(Continued)*

Kind of land	Number assigned the system	Year of the system	Winter and crops planted crops	Summer crops planted after winter crops
Mow	5	1st	Kaoliang or millet	.....
		2nd	Spring wheat[1] or barley	.....
„	6	1st	Wheat	.....
		2nd	Corn	.....
		3rd	Soybeans	.....
		4th	Kaoliang	.....
„	7	1st	Corn and small beans	.....
		2nd	Linseed and small beans	.....
		3rd	Kaoliang or millet	.....
„	8	1st	Hemp (usually continuously planted)	.....
„	9	1st	Spring wheat[1]	.....
		2nd	Buckwheat and winter radish or soybeans	.....
		3rd	Millet	.....
		4th	Soybeans	.....
		5th	Kaoliang	.....
„	10	1st	Spring wheat[1]	.....
		2nd	Soybeans	.....
		3rd	Wheat	Buckwheat
		4th	Kaoliang	.....
			Wutai Hsien, Shansi	
Hillside (Terraced)	1	1st	Irish potatoes	.....
		2nd	Wheat, spring	.....
		3rd	Millet (foxtail)	.....
		4th	Kaoliang	.....
		5th	Millet	.....
„	2	Wheat continuously if the operator and landlord agree		.....
Level	3*	1st	Oats	.....
		2nd	Hemp	.....
		3rd	Soybeans	.....
		4th	Irish potatoes	.....
		5th	Millet	.....
„	4	1st	Oats	.....
		2nd	Oats	.....
		3rd	Oats	.....
		4th	Soybeans	.....
		5th	Hemp	.....
Mountains (Terraced)	5	1st	Millet	.....
		2nd	Kaoliang	.....
		3rd	Irish potatoes	.....
		4th	Wheat, spring	.....
		5th	Wheat, spring	.....
Wet land	6	Oats continuously if the land is too wet for other crops		.....

[1] Spring wheat is limited in acreage, but is sometimes planted along the bank of the river and in years of too late harvesting of fall crops or when there is no possibility of planting other crops in fall.

TABLE 1.—*(Continued)*

East Central China Localities

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
Laian Hsien (1921), Anhwei				
Wet land	1*	1st	Wheat or wheat and field peas	Rice or soybeans
		2nd	Rice	.....
,,	2	1st	Rice	.....
Laian Hsien (1922), Anhwei				
,,	1	1st	Wheat	Rice, or summer fallow
		2nd	Rice	.....
,,	2	1st	Wheat	Rice, or summer fallow
		2nd	Wheat	Rice, or summer fallow
		3rd	Rice	.....
Wuhu Hsien, Anhwei				
,,	1†	1st	Rapeseed	Rice
		2nd	Rapeseed	Rice
		3rd	Rapeseed	Rice
		4th	Rapeseed, or wheat	Rice
		5th	Rice	.....
			Astragalus sinensis (introduced when crop yields become very low)	
Chinhai Hsien, Chekiang				
No information on cropping systems was reported for this region.				
Lienkiang Hsien, Fukien				
No information on cropping systems was reported for this region.				
Kiangning Hsien (S), Kiangsu				
Dry	1	1st	Broad beans	Sesame
,,	2	1st	Barley, hulless and broad beans	Sweet potatoes
		2nd	Broad beans or peas	Soybeans
,,	3	1st	Barley and broad beans or filed peas	Green or red beans
Dry	4	1st	Barley (hulless)	Vegetables (ch'ing tsai)
		2nd	Barley (hulless) and field peas	Sweet potatoes
,,	5	1st	Wheat or wheat and field peas	Soybeans
,,	6*	1st	Wheat	Sweet potatoes
,,	7	1st	Peas	Watermelon
Paddy	8*	1st	Astragalus sinensis	Rice (glutinous or non-glutinous)

TABLE 1.—*(Continued)*

Kind of land	Number assigned the system	Year of the system	Winter and spring planted crops	Summer crops planted after winter crops
Paddy	9	1st	Barley and field peas	Rice
		2nd	Barley, hulless, and broad beans	Rice
„	10†	1st	Wheat	Rice
		Kiangning (T) Hsien, Kiangsu		
High	1*	1st	Wheat	Soybeans
		2nd	Wheat or barley	Sweet potatoes
		3rd	Broad beans or field peas	Corn and soybeans
„	2	1st	Wheat	Corn and soybeans
		2nd	Barley	Sesame and green beans
		3rd	Broad beans or field peas	Corn
„	3	1st	Wheat or barley	Soybeans and sesame
		2nd	Broad beans or field peas	Sweet potatoes
		3rd	Cotton	....
„	4	1st	Wheat	Sesame and red beans
		2nd	Wheat or barley	Green beans
		3rd	Wheat or barley	Sweet potatoes
„	5	1st	Watermelons	Green beans
		2nd	Watermelons and cowpeas	Taro or winter radish
Low	6*	1st	Barley (naked)	Rice
		2nd	Field peas or broad beans	Rice
„	7	1st	Wheat or barley	Rice
		2nd	Green manure (field peas)	Rice
		Wuchin Hsien, Kiangsu		
High paddy	1	1st-4th	Wheat	Rice, late
		5th	Astragalus sinensis	Rice, late
„ „	2	1st	Wheat	Rice, late
		2nd	Wheat	Rice, glutinous
		3rd	Astragalus sinensis	Rice, late
		4th	Wheat	Rice, late
		5th	Wheat	Rice, late
„ „	3*	1st	Wheat and field peas	Rice, late
		2nd	Wheat and field peas	Rice, late
		3rd	Broad beans	Rice, late
„ „	4	1st	Broad beans	Rice, late
		2nd	Wheat	Rice, late
		3rd	Wheat	Rice, late
		4th	Broad beans	Rice, late
		5th	Wheat	Rice, late

TABLE 1.—*(Continued)*

Kind of land	Number assigned the system	Year of the system	Winter and crops planted crops	Summer crops planted after winter crops
High Paddy	5	1st	Wheat	Rice, late
		2nd	Astragalus sinensis	Rice, glutinous
		3rd	Astragalus sinensis	Rice, late
		4th	Wheat	Rice, late
Medium paddy	6*	1st		Rice, late
		2nd	Wheat	Rice, early
		3rd	Astragalus sinensis	Rice, late
„	7	1st	Wheat	Rice, late
		2nd	Broad beans	Rice, late
		3rd	Wheat	Rice, glutinous
		4th	Wheat	Rice, glutinous
		5th	Broad beans	Rice, late
Low paddy	8	1st	Wheat and broad beans	Rice, early
		2nd	Wheat	Rice, early
		3rd	Wheat	Rice, late
		4th	Wheat and broad beans	Rice, late
		5th	Wheat	Rice, late
Low paddy	9*	1st-3rd	Wheat	Rice, early
		4th-5th	Astragalus sinensis	Rice, early
„ „	10	1st	Broad beans	Rice, early
		2nd	Wheat	Rice, early
„ „	11*	1st	Wheat	Rapeseed
		2nd	Rape	Rice, early
		3rd	Wheat	Rice, early
		4th	Wheat	Taro
		5th	Vegetables	Rice, early
High	12	1st	Mulberry	Sesame
		2nd	Mulberry	Soybeans
			Mulberry continues for at least the life of the orchard	
Clay	13	1st	Wheat	Rice, late
		2nd	Wheat	Rice, late
		3rd	Astragalus sinensis or broad beans	Watermelon and soybeans
„	14	1st	Wheat and field peas	Rice, glutinous
		2nd	Astragalus sinensis	Rice, late
		3rd	Wheat and field peas	Rice, late
		4th	Wheat	Rice, glutinous
Edge of canal	15	1st-2nd		Rice, early
		3rd	Astragalus sinensis	Rice, early
		4th	Wheat	Rice, early
		5th	Barley	Rice, early

*These represent some of the better cropping systems.

†Rotations most frequently used.

‡This rotation is changed only when the land fails to produce a fair crop of wheat. Kaoliang, a crop to which manure is applied, is then introduced into the system.

The cropping systems as presented in table 1, however, are suggestive. The data show various possible crop combinations and the crops that may be planted as summer (or second) crops after winter ones. In some cases the one year systems may be part of a several years' rotation.

The kind of land used for each system is given in table 1, except where it was not reported. Land is classified in the North China plains into "high land," which never floods, "low land," which often floods, and "medium land," which has an elevation between the high and low land and is sometimes flooded. In East Central China the classification is dry land, or land not used for rice, and wet land (paddy), which is devoted to rice.

The cultivated crops include wheat, barley, and rapeseed, and these are cultivated at least once in North China and two or three times in East Central China. Millet is cultivated at least twice; kaoliang is cultivated four to six times during the season. Kaoliang, millet, corn, sweet potatoes, and Irish potatoes are usually cultivated much more than the cereals, with the possible exception of rice.

Legumes are found in all the regions studied and this is typical of their universal use throughout the country. They may be classified into winter and summer (or second crop) legumes. Field peas in association with wheat are common in East Central China and for the more southern regions of North China. Vetch is also planted in association with wheat and barley to a limited extent in East Central China and in the southern sections of North China. The peas ripen at the same time as the wheat and are harvested and threshed together and often ground together into flour. Field peas are also planted as a single crop to be used as green peas, mature peas, or as a green manure crop in rice fields. Broad beans are common in East Central China either as a single crop or in rows between wheat or barley or along edges of wheat and barley fields. *Astragalus sinensis* is frequently grown as a winter legume on rice land in southern Kiangsu, although, of course, not confined to this province. It is a green manure crop and is often cut and worked into the mud of other rice fields.

Summer legume crops occupy by far the larger proportion of the legume area. These are chiefly beans of various kinds but also include cowpeas. There is very little green manuring in North China. At Su Hsien, Anhwei, green beans, *Phaseolus aureus*, and sesame are sometimes planted after wheat harvest the first week in June and are turned under in July before the end of the summer rains. These crops are used because the seeds are small and therefore inexpensive since a small amount plants a large piece of land. The climate of North China is too dry to permit the turning under of green manure crops in the spring. Other crops which should be mentioned with legumes, because of their use as green manures, are wheat and barley in East Central China, where it is not infrequent to plough under these crops before planting rice.

The cropping systems for North China show far greater diversification than for East Central China partly because a larger variety of crops can be grown on the upland soils of the North than on the rice lands of East Central China and partly because of the profit in growing rice even on land that could also produce other kinds of crops. This greater diversification in North China is also caused by the desire of the farmers to reduce the cost of living by becoming as self-sufficient as possible, and they accomplish this by raising the many crops that are needed for the use of the family. Farmers feel that it is more economical and more convenient to use their own products than to purchase from others.

North China has 12 to 15 crops in some localities as compared with three or four in East Central China. This greater diversification lessens the risk from crop failure, utilizes plant food more efficiently, maintains better soil conditions, distributes income over a larger part of the year, and gives a much better labor distribution. A good system also controls weeds and one is impressed in China with the few mature weeds in the fields. Cultivation of cereal crops as well as the thorough cultivation of the other crops plays an important part in the elimination of weeds.

14. *A typical fuel-gleaning scene near Yihsien, Shantung, in North China, where every scrap of crop residue is being raked off. Such fields are often raked over and over by successive gleaners.*

In regions where wheat or rice is not rotated with other crops there are special reasons for such a one crop system. In North China some of the low land, which is often spoken of as "lake land" because it is flooded and becomes a lake in the summer time, is only free from water during the season that wheat can be grown. In East Central China some land is too low and too wet to grow anything but rice, thus accounting for this one crop system.

The possible combinations found of the more important winter and summer (second) crops are as follows: in North China, wheat, followed by soybeans, green beans, red beans, cowpeas, sesame, sweet potatoes, millet, carrots, tobacco, buckwheat, Chinese cabbage, onions, hemp, corn, indigo, proso millet and taro;[1] in East Central China, wheat, wheat and field peas (in association), barley, barley and field peas (in association), rape and broad beans, followed by rice, soybeans, sweet potatoes, and corn. In Kiangning Hsien (S), Kiangsu, watermelons are planted among field peas. In the same locality vegetables are also planted after barley. *Astragalus sinensis* is followed by rice only. In North China wheat and field peas (in association) and barley may be followed by soybeans, green beans and red beans, sesame, and sweet potatoes. In most localities where millet is a summer crop after wheat it is too cold for field peas to be planted with wheat and this probably accounts for millet not appearing after wheat and peas.

By far the larger proportion of the cropping systems, with the exception of rice fields, contain the following essentials of a rotation system; a shallow rooted crop, a deep rooted crop, a cultivated crop, and a leguminous crop.

The localities included in the study do not by any means exhaust the types of cropping systems to be found in either North China or East Central China. A special study of these would be invaluable in introducing systems from one region to

[1] Rice after wheat occurs in the southern portions of North China.

another of similar climatic and soil conditions, either in China or in other parts of the world.[1]

TYPES OF FARMING

Grain farming is the predominant type in each of the seventeen localities studied. Wheat or rice, except in three localities where millet and kaoliang are the most important crops, cover greater areas than any other crops. This statement is modified to some extent in Chinhai Hsien, Chekiang, and in Lienkiang Hsien, Fukien, where cotton in the first and sweet potatoes in the second locality are of second importance to rice. Ranking the crops according to five per cent or more of crop area occupied, seventeen different crops appear in such a classification, six being the largest number and two the smallest number for any one locality. Wheat and rice take first rank for seven localities each; kaoliang takes first, second, or third rank for nine localities, and soybeans are important in five (table 2) localities.

Why one locality grows certain crops and another altogether different ones or why some crops are grown more than others, are questions not always easily answered. Not much rice is grown in North China because of porous soil conditions and shortage of water. Temperature is not a limiting factor in much of North China as is evidenced by the growing of rice where soil is suitable and water sufficient, such as at Chintze on the Taiyuan plain of Shansi or near the Summer Palace at Peiping and near Tsinan, Shantung. Another such district is about half way between Szechow and the Hungtze Lake in northeastern Anhwei. The rice soils of East Central China are clay or have an impervious subsoil of clay which retains water; where this is not true there is an abundance of water and the water table is very near the surface. The northern border of the rice growing districts of East Central China is the Hwai River and continues through Tsingkiang, Kiangsu, on the Grand Canal. North of this rice is found only where soil and water conditions are especially favorable.

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[1] From the standpoint of world agriculture, studies of the cropping systems of the world for given climatic and soil conditions are as important and significant as plant introductions—a field of endeavor in which so much effort has already been put by some government agricultural departments.

TABLE 2. IMPORTANT CROPS RANKED BY PROPORTION OF CROP HECTARE AREA OCCUPIED*

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Wheat †	Rice	Kaoliang †	Millet	Soybeans	Barley	Corn †	Green beans	Sweet potatoes	Field peas	Sesame	Oats	Vegetables	Irish potatoes	Rapeseed	Cotton	Soybeans (black)
North China																	
Anhwei																	
Hwaiyuan	1	2	3	...	...	5	...	...	...	...	4	...	...	...	...	...	...
Su	1	...	3	...	2	4	...	5	...	6	...	...	...	...	...	...	...
Chihli																	
Pingsiang	2	...	1	3	...	...	...	...	...	...	...	...	5	...	...	...	4
Yenshan (1922)	1	...	2	4	3	...	5	...	...	...	...	...	...	...	...	...	...
Yenshan (1923)	1	...	2	3	6	...	5	...	...	...	...	...	...	...	...	...	4
Honan																	
Sincheng	1	...	3	2	...	6	5	...	...	...	...	...	...	...	...	...	4
Kaifeng	1	...	3	4	...	5	...	2	...	...	6	...	...	...	...	...	...
Shansi																	
Wusiang	2	...	3	1	...	...	...	4	...	...	...	...	...	...	...	...	...
Wutai	4	...	3	1	6	...	...	...	...	...	...	2	...	5	...	...	...
East Central China																	
Anhwei																	
Laian (1921)	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laian (1922)	2	1	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
Wuhu	3	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...
Chekiang																	
Chinhai	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
Fukien																	
Lienkiang	3	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
Kiangsu																	
Kiangning (S)	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kiangning (T)	2	1	...	...	4	3	...	...	...	...	...	...	...	...	...	...	...
Wuchin	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

*The numerals represent the order of importance, one being the greatst area, two the second greatest and so on.
†These crops sometimes have other crops in association and in such instances have also been included in the table.

Wheat in China has a very wide geographical distribution because climatic conditions are generally favorable and because it is one of the few crops that can be grown in winter. Even as far south as Lienkiang Hsien, Fukien, at sea level, some winter wheat is grown. At Wutai Hsien, Shansi, where elevation above sea level is high, only spring wheat can be raised. In Wuhu Hsien, Anhwei, the area devoted to rapeseed is increasing and displacing winter wheat because of the better market for rapeseed as an export to Japan. This is a good example of the effect of markets on the type of farming. In parts of Chinhai Hsien, Chekiang, cotton is grown rather than rice because of the lighter soils. Broad beans are particularly suited to the milder and more moist winters of the Yangtze Valley.

Topographical conditions result in an interesting practice of a few farmers at Su Hsien, Anhwei, where sesame and rice are sown together in the depressions, or "lake land," of the plain. Sesame does not grow well if the ground is too wet, whereas rice does best in water. If the season is a dry one a crop of sesame is produced, or, if wet, a crop of rice.

Custom is another important factor in determining the type of farming of a region. Fifteen years ago no sweet potatoes were grown in the Kiangning Hsien (S), Kiangsu, area studied. Emigrant farmers from Shantung introduced the sweet potato and now the sandy loam hills of the region, formerly entirely uncultivated, are being gradually broken up and planted to sweet potatoes.

Dietary habits also have a distinct relation to types of farming. In Kiangning Hsien, Kiangsu, as well as in other neighboring hsiens, rice is the staple food of the people. For this reason the slightly rolling hill land is also devoted to rice growing, the irrigation being from ponds dug to catch the run-off from the hills. Often, however, droughts occur and there is insufficient water even to plant the rice crop. In spite of this, farmers continue to try to raise rice on such land because they prefer to eat rice and because a good harvest of rice brings in excellent returns. It seems apparent that the habit of eating and growing rice in rice districts has become so fixed that often land better adapted to other crops is still used for rice.

That types of farming may very greatly affect profits any one year is shown in Chinhai Hsien, Chekiang, where some of

the farmers grew cotton and others did not. For farms of practically the same size the nineteen farmers having three-fourths of the crop hectare area in cotton made farm labor earnings averaging $319, compared with forty-eight farmers growing chiefly rice, which yielded well, and making labor earnings of only $109.

In general, however, farmers usually are growing the crops best suited to the locality. By the trial and error method they have found out which are the most profitable. This does not hold entirely true, however, and particularly not during periods of changing prices or changing demands for crops such as is now exists in China. The farmer often fails to make adjustments as quickly as the new situation demands. For this reason careful consideration should be given in each locality to discover possible adaptations which would bring greater profits or larger food production for family consumption. For instance, in Kiangning Hsien (S), Kiangsu, the low hills are suited to the growing of peanuts, sweet potatoes, and fruits, all of which are produced locally in insufficient quantities to supply the market demands of the city of Nanking. With the exception of the peach orchards recently established by many farmers, almost no fruit is produced; yet the soil and topographical conditions seem admirably fitted for fruits of various kinds. This is but one of many possibilities.

DISTRIBUTION OF CROPS

Areas occupied by crops

A classification of crops by the proportion of crop hectare area occupied reveals crops chiefly of an extensive nature; over nine-tenths of such area is in seeds of which over seven-tenths is in grains, about one-tenth in legumes, and three per cent in oil seeds, the last chiefly sesame and rapeseed (tables 3 and 4, and fig. 1).

The actual number of hectares growing each crop is given in appendix III table 1, while the proportion of crop hectare area occupied by each crop is shown in table 3. The relative importance is discussed under the topic, types of farming.

While the number of localities studied is too few to represent the country as a whole, still the preponderance of grains and other seeds gives an accurate impression. Complete data for

TABLE 3. PERCENTAGE OF CROP HECTARE AREA DEVOTED TO VARIOUS CROPS†

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	First or second crop harvested from the same piece of land during the same season	SEEDS										
		GRAINS							Legumes intertilled with grains	LEGUMES		
		Wheat	Rice	Kaoliang	Millet	Barley	Corn	Glutinous rice	Corn and soybeans	Soybeans	Green beans	Field peas
North China												
Anhwei												
Hwaiyuan	1st	32.0	4.4	13.5	0.5	5.7	...	...	...	...	...	...
	2nd	...	22.5	...	...	...	...	...	...	2.8	2.3	...
Su	1st	21.0	...	11.1	1.5	10.3	...	...	...	...	...	5.9
	2nd	...	...	...	...	...	...	...	...	23.6	7.7	...
Chihli												
Pingsiang	1st	24.3	...	17.0	5.8	1.1	...	...	...	0.8	...	...
	2nd	...	...	...	15.6	...	...	...	...	...	...	...
Yenshan (1922) ..	1st	35.9	...	19.8	9.0	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	7.8	...	12.2	10.9	0.6	...
Yenshan (1923) ..	1st	38.9	...	19.7	8.9	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	7.4	...	6.1	4.8	0.3	...
Honan												
Sincheng	1st	39.1	...	9.3	1.5	5.9	0.1	...	...	...	...	0.2
	2nd	...	...	...	12.0	...	7.5	...	...	1.5	3.0	...
Kaifeng	1st	37.1	...	8.1	6.0	5.1	...	...	...	...	...	0.1
	2nd	...	...	...	...	...	1.3	...	3.5	3.7	13.5	...
Shansi												
Wusiang	1st	23.9	...	2.3	33.2	1.8	...	...	...	0.6	0.6	...
	2nd	...	...	...	...	...	...	...	...	...	...	...
Wutai	1st	8.6	...	17.1	18.0	...	...	...	...	5.4	0.7	2.1
	2nd	...	...	...	...	...	...	...	...	...	...	...
Weighted average ..	1st	*24.5*	*0.4*	*12.9*	*9.4*	*4.2*	—	...	...	*1.5*	*0.2*	*1.9*
	2nd	...	*1.7*	...	*1.6*	...	*1.8*	...	*1.4*	*7.1*	*4.0*	...
East Central China												
Anhwei												
Laian (1921) ..	1st	12.5	46.0	...	...	1.0	1.8	2.7	...	...	...	...
	2nd	...	6.7	...	...	...	...	...	3.4	2.4	2.4	...
Laian (1922) ..	1st	37.8	30.5	...	...	2.4	0.6	...	...	...	...	1.0
	2nd	...	11.1	...	...	...	...	0.8	...	3.9	7.7	...
Wuhu	1st	5.2	10.9	...	...	0.6	...	...	...	...	...	...
	2nd	...	42.5	...	...	...	...	1.6	...	...	...	...
Chekiang												
Chinhai	1st	1.9	57.5	...	...	...	...	...	...	...	...	0.7
	2nd	...	1.6	...	...	...	...	4.2	...	0.7	...	...
Fukien												
Lienkiang	1st	7.3	44.8	...	...	...	...	...	...	...	...	...
	2nd	...	9.0	...	...	...	...	...	...	...	...	...
Kiangsu												
Kiangning (S) ..	1st	44.4	0.4	...	...	0.4	...	...	...	...	...	...
	2nd	...	42.6	...	...	...	...	1.3	...	4.0	0.7	...
Kiangning (T) ..	1st	28.4	3.0	...	...	13.4	...	0.2	...	...	...	4.0
	2nd	...	29.4	...	...	...	0.5	0.3	4.7	12.0	...	...
Wuchin	1st	34.9	1.8	...	...	1.1	...	3.2	...	...	...	0.4
	2nd	...	46.5	...	...	...	...	...	...	0.1	...	...
Weighted average ..	1st	*26.3*	*17.9*	...	...	*3.0*	*0.4*	*1.0*	...	...	...	*0.9*
	2nd	...	*27.7*	...	...	...	*0.1*	*0.6*	*1.3*	*3.7*	*1.4*	...
Weighted average, 17 localities ..	1st	*25.3*	*6.0*	*8.8*	*6.4*	*3.8*	*0.1*	*0.3*	...	*1.0*	*0.1*	*1.6*
	2nd	...	*10.0*	...	*1.0*	...	*1.2*	*0.2*	*1.4*	*6.0*	*3.2*	...

TABLE 3.—*(Continued)*

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	First or second crop harvested from the same piece of land during the same season	SEEDS			Tubers	FIBERS		Vegetables	Fruits	All other crops †	Total
		Legumes	Oil seeds								
		Soybeans (black)	Sesame	Rapeseed	Sweet potatoes	Cotton	Hemp				
North China											
Anhwei											
Hwaiyuan	1st	...	...	0.1	0.2	1.5	0.3	0.2	...	3.6	100.0
	2nd	...	6.0	...	3.7	...	...	...	...	0.7	
Su	1st	...	...	...	...	1.2	0.4	0.1	...	10.4	100.0
	2nd	0.6	2.7	...	2.9	...	...	...	0.1	0.5	
Chihli											
Pingsiang	1st	4.7	...	...	...	...	...	5.5	...	22.4	100.0
	2nd	...	...	...	...	...	2.7	...	...	0.1	
Yenshan (1922) ..	1st	...	...	...	...	...	...	0.1	0.3	0.5	100.0
	2nd	0.2	...	...	...	...	...	...	...	2.7	
Yenshan (1923) ..	1st	...	...	...	...	...	...	0.2	...	0.4	100.0
	2nd	8.5	...	...	...	...	...	...	...	4.8	
Honan											
Sincheng	1st	...	...	...	...	...	...	...	2.2	0.7	100.0
	2nd	8.0	1.9	...	4.3	...	...	...	...	2.8	
Kaifeng	1st	...	...	...	...	1.2	0.6	0.6	...	...	100.0
	2nd	...	2.7	...	5.1	...	...	0.1	0.4	10.9	
Shansi											
Wusiang	1st	...	...	0.9	...	...	1.8	0.2	0.5	30.3	100.0
	2nd	...	...	...	...	...	...	...	...	3.9	
Wutai	1st	...	...	...	...	...	0.5	...	...	47.6	100.0
	2nd	...	...	...	...	...	...	...	...	...	
Weighted average ..	1st	*0.1*	...	*0.1*	—	*0.5*	*0.5*	*0.3*	*0.2*	*18.0*	—
	2nd	*1.5*	*1.6*	...	*2.0*	...	—	—	*0.1*	*2.5*	*100.0*
East Central China											
Anhwei											
Laian (1921) ..	1st	...	...	0.3	...	1.9	0.6	1.7	...	15.7	100.0
	2nd	...	0.7	...	0.1	...	...	...	...	0.1	
Laian (1922) ..	1st	...	...	1.2	...	0.3	0.2	2.3	...	...	100.0
	2nd	...	0.2	...	...	...	...	...	...	...	
Wuhu	1st	...	...	35.9	...	...	...	...	...	3.3	100.0
	2nd	...	...	...	...	...	...	...	...	...	
Chekiang											
Chinhai	1st	...	...	1.0	...	17.4	...	1.6	3.7	5.8	100.0
	2nd	...	...	...	2.1	...	...	...	...	1.8	
Fukien											
Lienkiang	1st	...	...	1.7	33.5	...	0.5	0.1	...	0.4	100.0
	2nd	...	...	...	0.4	...	0.3	1.9	...	0.1	
Kiangsu											
Kiangning (S) ..	1st	...	...	...	...	0.1	...	0.5	...	4.7	100.0
	2nd	...	0.6	...	0.1	...	...	...	...	0.2	
Kiangning (T) ..	1st	...	...	...	0.2	...	...	0.2	0.1	2.5	100.0
	2nd	...	0.2	...	0.1	0.1	...	0.1	...	0.6	
Wuchin	1st	...	...	0.3	...	...	...	...	...	10.9	100.0
	2nd	...	0.1	...	...	...	...	0.1	...	0.6	
Weighted average ..	1st	...	...	*3.4*	*2.7*	*0.9*	*0.2*	*0.7*	*0.1*	*6.2*	—
	2nd	...	*0.3*	...	*0.2*	—	—	*0.2*	...	*0.3*	*100.0*
Weighted average, 17 localities ..	1st	*0.1*	...	*1.1*	*0.9*	*0.7*	*0.3*	*0.4*	*0.2*	*14.2*	—
	2nd	*1.0*	*1.2*	...	*1.4*	—	*0.1*	*0.1*	*0.1*	*1.3*	*100.0*

TABLE 8—(Continued)

†The more important of these crops are here given. The numerals in parentheses represent 1st or 2nd crops.

HWAIYUAN:	Wheat and field peas, 3.4 (1); sesame and small beans, 0.4 (2); sesame and soybeans, 0.3 (2); peanuts, 0.1 (1); indigo, 0.1 (1); carrots—, tobacco—.
SU:	Wheat and field peas, 9.8 (1); peanuts, 0.2 (1), 0.1 (2); carrots, 0.1 (2), Irish potatoes,—red turnips,—others;—miscellaneous, 0.4 (1), 0.3 (2).
PINGSIANG:	Kaoliang and black soybeans, 22.4 (1); indigo, 0.1 (2).
YENSHAN (1922):	Soybeans and millet, 2.1 (2); kaoliang and millet, 0.5 (1); miscellaneous, 0.6 (2).
YENSHAN (1923):	Proso millet, 1.5 (2); soybeans and millet, 1.0 (2); jute, 0.3 (1); others, 0.1 (1); carrots—; miscellaneous, 2.3 (2).
SINCHENG:	Buckwheat, 2.7 (2); peanuts, 0.4 (1); sesame and green beans, 0.3 (1); miscellaneous, 0.1 (2).
KAIFENG:	Proso millet, 4.4 (2); sesame and green beans, 4.3 (2), red beans, 2.2 (2).
WUSIANG:	Kaoliang and green beans, 23.0 (1); buckwheat, 3.7 (2); squash and potatoes, 2.9 (1); proso millet, 1.4 (1); others, 0.2 (2); Irish potatoes, 0.1 (1); miscellaneous, 2.9 (1).
WUTAI:	Oats, 23.9 (1); proso millet, 17.5 (1); Irish potatoes, 6.2 (1).
LAIAN (1921):	Wheat and field peas, 15.5 (1); miscellaneous, 0.2 (1), 0.1 (2).
WUHU:	Wheat and field peas, 3.0 (1); miscellaneous, 0.3 (1).
CHINHAI:	Broad beans, 4.5 (1); taro, 1.8 (2); miscellaneous, 1.3 (1).
LIENKIANG:	Taro, 0.3 (1), 0.1 (2); miscellaneous, 0.1 (1).
KIANGNING (S):	Barley hulless, 4.5 (1); red beans, 0.2 (2); miscellaneous, 0.2 (1).
KIANGNING (T):	Broad beans, 2.4 (1); sesame and green beans, 0.2 (2); sesame and red beans, 0.2 (2); watermelons and cowpeas, 0.1 (2); Astragalus sinensis, 0.1 (1); taro,—turnips;—miscellaneous, 0.1 (2).
WUCHIN:	Astragalus sinensis, 4.8 (1); broad beans, 3.7 (1); wheat and field peas, 2.2 (1); melons, and soybeans, 0.5 (2); taro, 0.2 (1); arrow-head 0.1 (2).

the whole country would show higher proportions for fibers, fruits, and for unclassified crops, such as tea and wood oil.

Aside from the outstanding proportion of crop hectare area in grains, individual regions show high percentages for certain crops. Lienkiang Hsien, Fukien, has over one-third of such area in sweet potatoes (when early and late rice interplanted are taken as one rather than as a first and second crop). Su Hsien, Anhwei, has thirty-eight per cent of its crop hectare area in legumes, chiefly soybeans, which are shipped to other places. Wuhu Hsien, Anhwei, has over a third of its area in rapeseed. At Chinhai Hsien, Chekiang, 17 per cent of the area is devoted to fibers, chiefly cotton.

Proportion of Farmers Growing Various Crops

The area devoted to various crops is of more significance than the proportion of farmers growing the crop, because if the area is great, it necessarily means that most farmers are raising the crop. On the other hand, if the area is small, it

TABLE 4. PERCENTAGE OF THE TOTAL CROP HECTARE AREA DEVOTED TO VARIOUS GROUPS OF CROPS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Crops classified as									
	Seeds									
	Grains	Legumes	Legumes intertilled with grains	Oil seeds	Tubers	Fibers	Vegetables	Fruits	Others	Total
North China										
Anhwei										
Hwaiyuan	78.6	5.2	4.1	6.1	3.9	1.8	0.2	...	0.1	100
Su	43.9	38.1	9.8	2.7	2.9	1.6	0.2	0.1	0.7	100
Chihli										
Pingsiang	63.8	5.5	22.4	...	...	2.7	5.5	...	0.1	100
Yenshan (1922)	73.0	11.7	14.3	...	...	...	0.1	0.3	0.6	100
Yenshan (1923)	76.4	18.6	7.1	...	...	0.3	0.2	...	2.4	100
Honan										
Sincheng	78.1	13.1	0.3	1.9	4.3	...	...	2.2	0.1	100
Kaifeng	62.0	19.5	7.8	2.7	5.1	1.8	0.7	0.4	...	100
Shansi										
Wusiang	66.3	1.2	23.1	0.9	3.0	1.8	0.2	0.5	3.0	100
Wutai	85.1	8.2	...	...	6.2	0.5	...	...	...	100
Average by localities	*69.7*	*12.9*	*9.9*	*1.6*	*2.8*	*1.1*	*0.8*	*0.4*	*0.8*	*100*
East Central China										
Anhwei										
Laian (1921)	70.7	4.8	18.9	1.0	0.1	2.5	1.7	...	0.3	100
Laian (1922)	83.2	12.6	...	1.4	...	0.5	2.3	...	...	100
Wuhu	60.8	...	3.0	35.9	...	...	...	...	0.3	100
Chekiang										
Chinhai	65.2	5.9	...	1.0	3.9	17.4	1.6	3.7	1.3	100
Fukien										
Lienkiang	61.1	...	...	1.7	34.3	0.8	2.0	...	0.1	100
Kiangsu										
Kiangning (S)	93.6	4.9	...	0.6	0.1	0.1	0.5	...	0.2	100
Kiangning (T)	75.2	18.4	5.2	0.2	0.3	0.1	0.3	0.1	0.2	100
Wuchin	87.5	4.2	2.7	0.4	0.3	...	0.1	...	4.8	100
Average by localities	*74.6*	*6.3*	*3.7*	*5.3*	*4.9*	*2.7*	*1.1*	*0.5*	*0.9*	*100*
Average by 17 localities	*72.0*	*9.3*	*7.0*	*3.3*	*3.8*	*1.9*	*0.9*	*0.4*	*0.9*	*100*

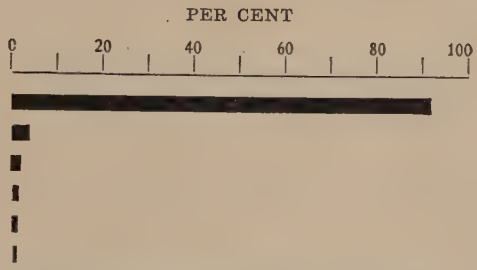

Figure 1.—Proportion of total crop hectares devoted to various types of crops.

2866 farms, 17 localities, seven provinces, China (1921-1925).

is of interest and importance to know whether a majority or only a few farmers are growing the crop. Such a count shows that 91 per cent of the farmers in North China grow wheat, compared with 67 per cent in East Central China, and that 92 per cent of the farmers in East Central China grow rice (table 5). Both facts indicate the relative importance of the two crops in the two regions. Barley, soybeans, and green beans are grown by a much larger proportion of farmers in North than in East Central China. Glutinous rice, a cash crop, is grown by only 10.5 per cent of the East Central China farmers. Kaoliang and millet are grown by over three-fourths of the North China farmers, but by none of the East Central China farmers.

Seasonal Distribution of Crops

Winter crops such as wheat, barley, broad beans, and rapeseed, occupy a little over one-third of the total crop hectare area, while summer crops following those of the winter occupy 29 per cent of such area. Spring planting uses up the remaining area (table 6). The areas of individual crops by season for all localities are given in table 7.

Of the crop area 55 per cent is devoted to winter crops, a little less than one-half to summer crops, and 45 per cent to spring planted crops. Because of climatic differences, North China localities, compared to those of East Central China, have a smaller proportion of crop area devoted to winter crops then to summer crops and have consequently a larger proportion of spring planted crops.

The proportions of these three seasonal types of planting vary considerably with the region. Wutai Hsien, Shansi, which is in a northern latitude and at a high elevation, has all its area devoted to spring planted crops only. Kiangning Hsien (S), Kiangsu, has nearly all its crop area planted to winter crops, chiefly wheat and barley, following which rice is grown in the summer. Chinhai Hsien, Chekiang, and Lienkiang Hsien, Fukien, have the longest growing period of all localities studied, yet approximately only one-tenth of the crop area is devoted to winter crops. This condition is reported for the same latitudes in Hunan and requires careful study of the reasons for no winter crop. Of the total area devoted to winter crops, only 83 per

TABLE 5. PER CENT OF FARMS GROWING THE SPECIFIED CROPS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	SEEDS														Tubers	Fibers		Vegetables	Fruits
	GRAINS							Legumes intertilled with grains	LEGUMES				OIL SEEDS						
	Wheat	Rice	Kaoliang	Millet	Barley	Corn	Glutinous rice	Corn and soybeans	Soybeans	Green beans	Soybeans (black)	Field peas	Sesame	Rapeseed	Sweet potatoes	Hemp	Cotton		
North China																			
Anhwei																			
Hwaiyuan	100.0	100.0	96.8	30.6	86.3	...	...	...	51.6	33.9	...	...	71.0	2.4	91.9	49.2	89.5	57.3	3.2
Su	64.3	...	95.8	45.1	75.5	...	...	...	97.2	73.4	3.8	28.0	53.1	...	91.6	27.3	60.8	5.2	5.2
Chihli																			
Pingsiang	71.7	...	57.2	80.3	16.4	...	...	...	9.2	...	28.9	...	...	...	...	36.2	...	69.7	...
Yenshan (1922)	99.3	...	88.0	66.7	...	52.0	...	70.7	54.7	10.0	2.0	...	...	...	0.7	...	...	5.3	5.3
Yenshan (1923)	93.2	...	97.0	70.7	...	54.9	...	40.6	31.6	6.0	38.3	...	...	...	...	...	...	14.3	...
Honan																			
Sincheng	100.0	...	100.0	99.3	98.6	98.6	...	...	28.5	65.3	97.9	2.8	59.7	...	96.5	...	...	2.1	43.1
Kaifeng	100.0	...	99.3	97.3	96.6	30.9	...	44.3	55.0	64.4	...	2.7	57.0	...	100.0	49.7	98.0	34.2	7.4
Shansi																			
Wusiang	88.4	...	9.2	100.0	15.9	...	...	...	0.8	3.2	...	...	...	8.0	...	36.7	0.8	3.6	3.2
Wutai	100.0	...	100.0	97.8	...	...	...	...	73.0	8.0	...	35.4	...	...	...	12.8	...	...	...
Average by localities	*90.8*	*11.1*	*82.6*	*76.4*	*43.3*	*26.3*	...	*17.3*	*44.6*	*29.4*	*19.0*	*7.7*	*26.8*	*1.2*	*42.3*	*23.5*	*27.7*	*21.3*	*7.5*
East Central China																			
Anhwei																			
Laian (1921)	41.6	89.1	...	...	17.8	17.8	17.8	19.8	21.8	21.8	...	...	6.9	5.0	6.9	16.8	26.7	70.3	2.0
Laian (1922)	96.0	86.0	...	...	24.0	12.0	9.0	...	33.0	46.0	...	8.0	4.0	7.0	1.0	8.0	9.0	92.0	...
Wuhu	43.1	100.0	...	...	9.8	...	13.7	...	...	...	...	...	...	96.1	...	...	...	...	...
Chekiang																			
Chinhai	25.4	73.1	...	...	...	...	40.3	...	9.0	...	...	10.4	...	13.4	23.9	...	28.4	25.4	52.2
Fukien																			
Lienkiang	35.4	100.0	...	...	...	...	...	...	...	...	...	...	...	22.4	70.8	5.0	...	37.3	...
Kiangsu																			
Kiangning (S)	100.0	100.0	...	...	3.9	...	26.6	...	52.7	19.2	...	...	22.2	...	2.5	...	3.9	13.3	...
Kiangning (T)	99.1	88.9	...	...	77.9	6.5	7.8	18.4	76.0	...	...	27.2	3.7	...	5.1	...	0.9	32.7	1.8
Wuchin	94.0	99.7	...	...	13.7	...	64.0	...	2.3	...	...	10.7	4.0	6.0	...	...	...	2.3	...
Average by localities	*66.8*	*92.1*	...	...	*18.4*	*4.5*	*22.4*	*4.8*	*24.4*	*10.9*	...	*7.0*	*5.1*	*18.7*	*13.8*	*3.7*	*8.6*	*34.2*	*7.0*
Average by 17 localities	*79.5*	*49.2*	*43.7*	*40.5*	*31.6*	*16.0*	*10.5*	*11.4*	*35.1*	*20.7*	*10.1*	*7.4*	*16.6*	*9.4*	*23.9*	*14.2*	*18.7*	*27.4*	*7.3*

TABLE 5—(Continued)

The percentage of farms growing other crops found in only one or at most several localities are listed as follows:

HWAIYUAN:	Wheat and field peas, 48.4; sesame and soybeans, 6.5; sesame and small beans, 1.6; peanuts, 32.3, carrots, 1.6, tobacco, 2.4; indigo, 40.3.
SU:	Wheat and field peas, 51.0; Irish potatoes, 1.4; carrots, 3.8; winter radish (red), 1.0; peanuts, 13.6; others, 3.1.
PINGSIANG:	Kaoliang and soybeans (black), 33.6; indigo, 1.3.
YENSHAN (1922):	Soybeans and millet, 12.7; kaoliang and millet, 3.3.
YENSHAN (1923):	Carrots, 0.8; soybeans and millet, 9.8; proso millet, 14.3; jute, 15.0; others, 9.8.
SINCHENG:	Buckwheat, 34.7; sesame and green beans, 5.6; peanuts, 2.8.
KAIFENG:	Sesame and green beans, 35.6; red beans, 43.6; proso millet, 79.2.
WUSIANG:	Irish potatoes, 4.0, proso millet, 18.7; buckwheat, 13.5; kaoliang and green beans, 88.0; others, 2.8; squash and sweet potatoes, 72.1.
WUTAI:	Irish potatoes, 99.1; proso millet, 99.6; oats, 96.0.
LAIAN (1921):	Wheat and field peas, 54.5.
WUHU:	Wheat and field peas, 22.5.
CHINHAI:	Taro, 26.9, broad beans, 53.7.
LIENKIANG:	Taro, 4.3.
KIANGNING (S):	Barley (hulless), 40.9; red beans, 5.4.
KIANGNING (T):	Taro, 0.5; broad beans, 36.4; winter radish (red), 0.5; *Astragalus sinensis*, 0.9; sesame and green beans, 21.5.
WUCHIN:	Broad beans, 58.3; *Astragalus sinensis*, 54.0; arrow-head, 4.0; melons and soybeans, 3.7; taro, 5.3; wheat and field peas, 5.7.

cent is replanted to a summer crop. The proportion of 87 per cent for East Central China is significantly higher than 79 per cent for North China and is caused by climatic differences. The small percentage for winter crop area devoted to summer crops at Laian Hsien, Anhwei, is caused partly by indifference on the part of the farmer toward the extra exertion. At Wusiang Hsien, Shansi, a limited growing season appears to be the chief reason. In some localities the land is so low that it is subject to summer floods and therefore is not planted to a second crop. Summer fallow after wheat harvest is also practiced to a certain extent and is followed by wheat in the autumn.

The index of double cropping, which is the crop hectare area divided by the crop area and multiplied by 100, is 147 for all localities; 144 for North China and 150 for East Central China (table 8). The variation is from no double cropping in Wutai Hsien, Shansi, to almost one hundred per cent in Kiangning Hsien (S), Kiangsu. There is only a little more double cropping on farms in the smallest size-group as compared with those in the largest size-group; this is caused chiefly by a larger proportion of better land on the smaller farms. Necessity for obtaining maximum production on the small farms

TABLE 6. PERCENTAGE OF CROP HECTARE AREA AND CROP AREA DEVOTED TO WINTER CROPS, TO SUMMER CROPS FOLLOWING WINTER CROPS, AND TO SPRING PLANTED CROPS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Percentage of crop hectare area devoted to			Percentage of crop area devoted to			Per cent of winter crop area devoted to summer crops
	Winter crops	Summer crops following winter crops	Spring planted crops	Winter crops	Spring planted crops	Summer crops following winter crops	
North China							
Anhwei							
Hwaiyuan	41.2	38.0	20.8	66.3	33.7	61.3	92.4
Su	47.0	38.1	14.9	75.9	24.1	61.6	81.2
Chihli							
Pingsiang	25.4	18.4	56.2	31.1	68.9	22.6	72.4
Yenshan (1922)	35.9	34.4	29.7	54.7	45.3	52.7	96.2
Yenshan (1923)	38.9	31.9	29.2	57.2	42.8	47.0	82.2
Honan							
Sincheng	45.2	41.0	13.8	76.6	23.4	69.9	91.2
Kaifeng	42.3	41.2	16.5	71.9	28.1	69.8	97.0
Shansi							
Wusiang	23.9	3.9	72.2	24.9	75.1	4.1	16.4
Wutai	...	...	100.0	...	100.0	...	...
Average by localities	*33.3*	*27.4*	*39.3*	*51.0*	*49.0*	*43.2*	*78.6*
East Central China							
Anhwei							
Laian (1921)	29.3	15.8	54.9	34.8	65.2	18.6	53.4
Laian (1922)	42.4	23.7	33.9	55.6	44.4	31.1	55.9
Wuhu	44.7	44.1	11.2	80.0	20.0	78.7	98.3
Chekiang							
Chinhai	11.0	10.4	78.6	12.3	87.7	11.8	95.5
Fukien							
Lienkiang	9.0	11.7*	79.3	10.3	89.7	13.2†	99.1
Kiangsu							
Kiangning (S)	50.0	49.5	0.5	99.0	1.0	97.8	97.1
Kiangning (T)	48.2	48.0	3.8	92.7	7.3	92.2	99.6
Wuchin	47.4	47.4	5.2	90.1	9.9	90.1	99.9
Average by localities	*35.3*	*31.3*	*33.4*	*59.4*	*40.6*	*54.2*	*87.4*
Average by 17 localities	*34.2*	*29.3*	*36.5*	*54.9*	*45.1*	*48.4*	*83.0*

*This includes 2.7 per cent for crops following spring planted crops as second crops on the same land during the growing season.

†This includes 3.0 per cent for crops following spring planted crops as the second crops of the same growing season.

TABLE 7. PERCENTAGE OF CROP AREA DEVOTED TO VARIOUS CROPS

2866 farms, 17 localities, seven provinces, China (1921-1925)

NORTH CHINA LOCALITIES

Hwaiyuan Hsien, Anhwei

WINTER CROPS (planted in the fall)		SPRING PLANTED CROPS (not following winter crops)		SUMMER CROPS (following winter crops)	
Kind	Per cent	Kind	Per cent	Kind	Per cent
Wheat	51.6	Kaoliang	21.7	Rice	36.3
Barley	9.2	Rice	7.1	Sesame	9.7
Wheat and field peas	5.4	Cotton	2.4	Sweet potatoes	6.0
Rapeseed	0.1	Millet	0.8	Soybeans	4.6
		Sweet potatoes	0.4	Green beans	3.7
Total	*66.3*	Hemp	0.4	Sesame and soybeans	0.5
		Vegetables	0.4	Sesame and small beans	0.5
		Peanuts	0·2	Sesame and green beans *	—
		Indigo	0.2	Small beans *	—
		Muskmelons	0.1	Carrots *	—
		Watermelons *	—		
		Cowpeas and melons *	—	*Total*	*61.3*
		Tobacco *	—		
		Total	*33.7*		

Su Hsien, Anhwei

Wheat	33.9	Kaoliang	17.9	Soybeans	38.1
Barley	16.7	Millet	2.5	Green beans	12.5
Wheat and field peas	15.8	Cotton	1.9	Sweet potatoes	4.7
Field peas	9·5	Hemp	0.7	Sesame	4.4
		Miscellaneous	0.7	Soybeans (black)	0.9
Total	*75.9*	Peanuts	0.3	Miscellaneous	0.5
		Vegetables	0.1	Carrots	0.1
		Winter radish *	—	Peanuts	0·1
		Total	*24.1*	Fruit	0.1
				Millet, Hemp, Cotton, Vegetables, Irish potatoes, Others	0.2
				Total	*61.6*

Pingsiang Hsien, Chihli

Wheat	29.8	Kaoliang and soybeans (black)	27.5	Millet	19.2
Barley	1.3	Kaoliang	20.8	Hemp	3.3
Total	*31.1*	Millet	7.1	Indigo	0.1
		Vegetables	6·8	*Total*	*22.6*
		Soybeans (black)	5.7		
		Soybeans	1.0		
		Miscellaneous*	—		
		Total	*68.9*		

TABLE 7—*(Continued)*

Yenshan Hsien (1922), Chihli

Winter crops (planted in the fall)		Spring planted crops (not following winter crops)		Summer crops (following winter crops)	
Kind	Per cent	Kind	Per cent	Kind	Per cent
Wheat	54.7	Kaoliang	30.2	Corn and soybeans	18.7
Total	*54.7*	Millet (foxtail)	13.7	Soybeans	16.7
		Kaoliang and millet	0.7	Corn	11.9
		Fruits (jujubes)	0.5	Millet and soybeans	3.2
		Vegetables	0.2	Green beans	0.9
		Total	*45.3*	Miscellaneous	0.9
				Soybeans (black)	0.4
				Total	*52.7*

Yenshan Hsien (1923), Chihli

Wheat	57.2	Kaoliang	28.9	Soybeans (black)	12.5
Total	*57.2*	Millet (foxtail)	13.1	Corn	10.8
		China jute	0.4	Corn and soybeans	9.0
		Vegetables	0.2	Soybeans	7.1
		Other	0.2	Miscellaneous	3.5
		Total	*42.8*	Millet	2.2
				Millet and soybeans	1.5
				Green beans	0.4
				Total	*47.0*

Sincheng Hsien, Honan

Wheat	66.4	Kaoliang	15.8	Millet	20.4
Barley	10.0	Fruits	3.6	Soybeans (black)	13.5
Field peas	0.2	Millet	2.6	Corn	12.8
Total	*76.6*	Peanuts	0.7	Sweet potatoes	7.4
		Sesame and green beans	0.4	Green beans	5.1
		Corn	0.2	Buckwheat	4.5
		Vegetables	0.1	Sesame	3.3
		Total	*23.4*	Soybeans	2.6
				Miscellaneous	0.2
				Sesame and green beans	0.1
				Total	*69.9*

Kaifeng Hsien, Honan

Wheat	63.0	Kaoliang	13.7	Green beans	23.1
Barley	8.7	Millet	10.2	Sweet potatoes	8.6
Field peas	0.2	Cotton	2.1	Proso millet	7.4
Total	*71.9*	Hemp	1.1	Sesame and green beans	7.3
		Vegetables	1.0	Soybeans	6.2
		Sesame *	—	Corn and soybeans	5.9
		Total	*28.1*	Sesame	4.6
				Redbeans	3.7
				Corn	2.3
				Fruits	0.5
				Vegetables	0.2
				Total	*69.8*

TABLE 7—*(Continued)*

Wusiang Hsien, Shansi

Winter crops (planted in the fall)		Spring planted crops (not following winter crops)		Summer crops (following winter crops)	
Kind	Per cent	Kind	Per cent	Kind	Per cent
Wheat	24.9	Millet (foxtail)	34.5	Buckwheat	3.9
		Kaoliang and green beans	24.1	Others	0.2
Total	*24.9*	Squash and Irish potatoes	3.0	*Total*	*4.1*
		Miscellaneous	2.9		
		Kaoliang	2.3		
		Barley	1.9		
		Hemp	1.9		
		Millet (proso)	1.4		
		Rapeseed	0.9		
		Soybeans	0.7		
		Green beans	0.6		
		Fruits	0.5		
		Irish potatoes	0.2		
		Vegetables	0.2		
		Cotton *	—		
		Total	*75.1*		

Wutai Hsien, Shansi

Oats	23.9
Millet (foxtail)	18.0
Millet (proso)	17.5
Kaoliang	17.1
Wheat	8.6
Irish potatoes	6.2
Soybeans	5.4
Field peas	2.1
Green beans	0.7
Hemp	0.5
Total	*100.0*

EAST CENTRAL CHINA LOCALITIES

Wheat and field peas	18.4	**Laian Hsien (1921), Anhwei**			
Wheat	14.8	Rice	54.5	Rice	7.9
Barley	1.2	Rice (glutinous)	3.2	Corn and soybeans	4.0
Rapeseed	0.4	Corn	2.2	Soybeans	2.9
Total	*34.8*	Cotton	2.2	Green beans	2.8
		Vegetables	2.1	Sesame	0.8
		Hemp	0.7	Sweet potatoes	0.1
		Miscellaneous	0.2	Miscellaneous	0.1
		Fruits	0.1	*Total*	*18.6*
		Total	*65.2*		
Wheat	49.6	**Laian Hsien (1922), Anhwei**			
Barley	3.1	Rice	40.0	Rice	14.5
Rapeseed	1.6	Vegetables	3.0	Green beans	10.1
Field peas	1.3	Corn	0.8	Soybeans	5.2
Total	*55.6*	Cotton	0.4	Glutinous rice	0.9
		Hemp	0.2	Sesame	0.3
		Total	*44.4*	Sweet potatoes	0.1
				Total	*31.1*

TABLE 7—*(Continued)*

Wuhu Hsien, Anhwei

Winter crops (planted in the fall)		Spring planted crops (not following winter crops)		Summer crops (following winter crops)	
Kind	Per cent	Kind	Per cent	Kind	Per cent
Rapeseed	64.3	Rice	19.5	Rice	75.9
Wheat	9.2	Miscellaneous	0.5	Glutinous rice	2.8
Wheat and field peas	5.4	*Total*	*20.0*	*Total*	*78.7*
Barley	1.1				
Total	*80.0*				

Chinhai Hsien, Chekiang

Broad beans	5.1	Rice	64.0	Glutinous rice	4.7
Wheat	2.1	Cotton	19.5	Sweet potatoes	2.3
Vegetables	1.8	Fruits	4.2	Rice	2.0
Miscellaneous	1.5	*Total*	*87.7*	Taro	2.0
Rapeseed	1.0			Soybeans	0.8
Field peas	0.8			*Total*	*11.8*
Total	*12.3*				

Lienkiang Hsien, Fukien

Wheat	8.3	Rice	50.8	Rice	10.2
Rapeseed	2.0	Sweet potatoes	37.9	Vegetables†	2.2
Vegetables*	—	Hemp	0.6	Sweet potatoes†	0.4
Total	*10.3*	Taro	0.3	Hemp†	0.3
		Millet	0.1	Taro†	0.1
		Vegetables*	—	Kaoliang†*	—
		Total	*89.7*	*Total*	*13.2*

Kiangning Hsien (S), Kiangsu

Wheat	87.8	Rice	0.8	Rice	84.2
Barley (hulless)	8.9	Cotton	0.2	Soybeans	7.9
Vegetables	1.0	*Total*	*1.0*	Glutinous rice	2.5
Barley	0.8			Green beans	1.5
Miscellaneous	0.5			Sesame	1.2
Total	*99.0*			Red beans	0.4
				Sweet potatoes	0.1
				Total	*97.8*

Kiangning Hsien (T), Kiangsu[1]

Wheat	54.5	Rice	5.7	Rice	56.4
Barley	25.8	Glutinous rice	0.4	Soybeans	23.0
Field peas	7.7	Vegetables	0.4	Corn and soybeans	9.0
Broad beans	4.7	Sweet potatoes	0.3	Corn	0.9
Total	*92.7*	Astragalus sinensis	0.3	Glutinous rice	0.6
		Cowpeas & melons	0.1	Sesame and green beans	0.5
		Watermelons	0.1	Sesame	0.4
		Cowpeas*	—	Sesame and red beans	0.4
		Taro*	—	Sesame and soybeans	0.2
		Total	*7.3*	Sweet potatoes	0.2

[1] The area in fuel has not been included here.

TABLE 7—*(Continued)*

Winter crops (planted in the fall)		Spring planted crops (not following winter crops)		Summer crops (following winter crops)	
Kind	Per cent	Kind	Per cent	Kind	Per cent
				Cotton	0.2
				Cowpeas & melons	0.2
				Watermelons ..	0.1
				Vegetables ..	0.1
				Turnips*	—
				Muskmelons* ..	—
				Total	*92.2*
Wuchin Hsien, Kiangsu					
Wheat	66.3	Glutinous rice ..	6.2	Rice (late & early)	88.4
Green manure ..	9.2	Rice	3.4	Melons and soybeans	0.9
Broad beans ..	7.1	Taro	0.3	Soybeans	0.2
Wheat and field peas	4.2	*Total*	*9.9*	Sesame	0.2
Barley	2,1			Water chestnuts ..	0.2
Field peas	0.8			Vegetables ..	0.2
Rapeseed	0.4			Sesame and red beans*	—
Total	*90.1*			*Total*	*90.1*

*The acreage for this item is too small to record a percentage.
†This follows spring planted crops, usually rice, as second crop.

is not the determining factor in amount of double cropping; but length of growing season and feasible crop combinations are, since they are the same for the small as for the large farms.

In fact double cropping varies little from any cause as is shown by a coefficient of variability of only 12.08 per cent (table 9). Cropping systems are about the same for all farms of a locality and since such systems largely determine the amount of double cropping the variability is naturally small.

CASH CROPS

Chinese farming is often thought of as self-sufficient and therefore farm products are supposed to be an unimportant item of commerce. It is found, however, after separating all the products raised into two classes, that the products sold constitute in value 53 per cent of the total (table 10). For North China the amount is a little over two-fifths while for East Central China it is more than three-fifths of the total. The variation is from 31 per cent in Yenshan Hsien (1923), Chihli,

TABLE 8. RELATION OF SIZE OF FARM TO INDEX OF DOUBLE CROPPING

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Index for farms grouped by size					
	Small	Medium small	Medium	Medium large	Large	Average
North China						
Anhwei						
Hwaiyuan	160	164	162	170	157	162
Su	175	...	178	...	156	170
Chihli						
Pingsiang	130	...	125	...	121	125
Yenshan (1921) ..	161	153	...	155	152	155
Yenshan (1922) ..	139	...	146	...	142	142
Honan						
Sincheng	177	170	...	171	169	172
Kaifeng	168	172	...	171	169	170
Shansi						
Wusiang	101	102	104	106	105	103
Wutai	100	100	100	100	100	100
Average by localities ..	*146*	...	*146*	...	*141*	*144*
East Central China						
Anhwei						
Laian (1921)	146	123	...	120	110	124
Laian (1922)	152	...	135	...	128	138
Wuhu	161	175	...	178	183	175
Chekiang						
Chinhai	110	...	112	...	112	111
Fukien						
Lienkiang	114	...	121	...	116	117
Kiangsu						
Kiangning (S) ..	190	200	...	198	199	197
Kiangning (T)* ..	186	168	155	153	149	161
Wuchin	179	180	181	178	172	179
Average by localities ..	*155*	...	*150*	...	*146*	*150*
Average by 17 localities	*150*	...	*148*	...	*144*	*147*

*The larger farms have a greater proportion of land producing one crop of fuel a year.

for a year in which the wheat crop was a failure, to 84 per cent in Chinhai Hsien, Chekiang, where a considerable area is devoted to cotton. This denotes a fairly commercialized agriculture which in turn indicates that the farmer must have considerable need for ready cash to meet his various requirements.

TABLE 9. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY OF INDEX OF DOUBLE CROPPING*

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	162±1.34	163±1.68	22.09±0.95	13.64±0.60
Su	170±0.50	173±0.63	12.65±0.36	7.44±0.21
Chihli				
Pingsiang	125±1.52	111±1.91	27.82±1.08	22.26±0.90
Yenshan (1922)	155±0.81	155±1.02	14.66±0.57	9.46±0.40
Yenshan (1923)	142±1.51	146±1.89	25.83±1.07	18.19±0.78
Honan				
Sincheng	172±0.60	174±0.75	10.72±0.43	6.23±0.25
Kaifeng	170±0.79	171±0.99	14.21±0.56	8.36±0.33
Shansi				
Wusiang	103±0.41	100±0.51	9.64±0.29	9.36±0.28
Average by localities	*150*	*159*	*17.20*	*11.87*
East Central China				
Anhwei				
Laian (1921)	124±1.18	121±1.48	17.61±0.84	14.20±0.69
Laian (1922)	138±1.42	137±1.78	20.98±1.00	15.20±0.74
Wuhu	175±1.69	180±2.12	25.24±1.19	14.42±0.70
Chekiang				
Chinhai	111±1.07	110±1.34	13.00±0.76	11.71±0.69
Fukien				
Lienkiang	117±1.18	106±1.48	22.20±0.83	18.97±0.74
Kiangsu				
Kiangning (S)	197±0.35	200±0.44	7.48±0.25	3.80±0.13
Kiangning (T)	161±0.95	156±1.19	20.81±0.67	12.93±0.43
Wuchin	179±0.49	180±0.61	12.65±0.35	7.07±0.19
Average by localities	*150*	*147*	*17.50*	*12.29*
Average by 17 localities	*150*	*156*	*17.35*	*12.08*

*Wutai Hsien, Shansi, is omitted because of no double cropping. The means for Kiangning (T), and Wuchin and the averages for East Central China and for all localities do not correspond with those in table 8 because the fuel area has been omitted.

Very few crops are raised entirely for sale (tables 11 and 12). Rapeseed grown in three of the localities studied has 99 per cent of the crop sold. The sole use of rapeseed except for export, is in making a vegetable table oil widely used in cooking.

TABLE 10. PROPORTION BY VALUE OF OPERATOR'S FARM PRODUCTS SOLD AND USED BY THE FARM FAMILY

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Percentage sold	Percentage used by the family
North China		
Anhwei		
Hwaiyuan	35.2	64.8
Su	40.3	59.7
Chihli		
Pingsiang	54.9	45.1
Yenshan (1922)	55.6	44.4
Yenshan (1923)	30.6	69.4
Honan		
Sincheng	37.6	62.4
Kaifeng	32.8	67.2
Shansi		
Wusiang	49.8	50.2
Wutai	54.9	45.1
Average by localities	*43.5*	*56.5*
East Central China		
Anhwei		
Laian (1921)	54.9	45.1
Laian (1922)	56.8	43.2
Wuhu	55.7	44.3
Chekiang		
Chinhai	83.8	16.2
Fukien		
Lienkiang	64.5	35.5
Kiangsu		
Kiangning (S)	73.7	26.3
Kiangning (T)	66.4	33.6
Wuchin	46.3	53.7
Average by localities	*62.8*	*37.2*
Average by 17 localities	*52.6*	*47.4*

Sesame is another important cash crop in six localities, where 79 per cent of the amount raised is sold. Wheat is an outstanding cash crop because of its wide geographical distribution. It is grown in fifteen of the localities studied and over one-half, 53 per cent, is sold. Soybeans follow in this respect, for 44 per cent of the crop is sold from the ten localities in which they are grown.

TABLE 11. PERCENTAGE VALUE OF CROPS SOLD TO THE TOTAL VALUE OF THE CROPS HARVESTED†

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Grains							Legumes				Oil seeds		Tubers	Fibers		Vegetables	Fruits
	Wheat	Rice	Kaoliang	Millet	Barley	Corn	Glutinous rice	Soybeans	Green beans	Field peas	Soybeans (black)	Sesame	Rapeseed	Sweet potatoes	Cotton	Hemp		
North China																		
Anhwei																		
Hwaiyuan	22.9	29.1	17.5	25.0*	10.8*	...	...	55.8	22.6*	...	...	98.1	96.1*	18.5	33.4	6.2*	12.2*	...
Su	31.3	53.8*	23.0	21.8	4.5*	...	...	30.4	31.1	29.8	7.6*	69.8	...	19.2	28.2	26.8	47.3*	...
Chihli																		
Pingsiang	59.2	...	10.5	30.8	18.3*	...	...	29.6*	...	...	29.2	100.0*	...	...	...	94.1	65.1	...
Yenshan (1922)	94.7	...	17.8	21.1	...	7.4*	...	10.8	21.5*	...	...	...	...	...	...	...	...	88.4*
Yenshan (1923)	42.3	...	18.0	25.7	...	20.3	...	14.9	44.2*	...	31.0	...	...	...	...	...	9.9*	...
Honan																		
Sincheng	28.6	...	13.2	10.9	3.1*	14.2	...	16.6*	34.4	5.9*	6.9	23.1	...	20.3	...	...	58.3*	...
Kaifeng	24.6	...	24.1	27.2	24.8	37.9	...	13.7	26.6	36.0*	...	92.7	...	30.4	2.2*	1.1*	43.6	...
Shansi																		
Wusiang	51.7	...	43.1	48.9	97.1	61.1*	...	22.3	46.4	75.0*	49.0*	...	98.8	...	34.5*	94.6	100.0*	100.0*
Wutai	31.3	...	30.0	26.6	50.0*	...	...	29.8	22.7*	23.3	...	...	30.0*	...	...	41.5	...	...
Average by localities	*43.0*	*29.1*	*21.9*	*26.6*	*61.0*	*24.1*	...	*25.4*	*34.6*	*26.6*	*22.4*	*70.9*	*98.8*	*22.1*	*30.8*	*64.3*	*54.4*	...
East Central China																		
Anhwei																		
Laian (1921)	53.1	36.6	...	41.7*	44.4*	56.7*	44.7*	43.2*	47.1	80.0*	...	38.1*	40.6*	32.4*	34.3*	25.8*	...	...
Laian (1922)	60.3	36.7	...	...	74.1	61.0*	66.3*	80.0	76.8	87.4*	...	65.0*	65.1*	88.9*	20.7*	11.2*	34.7*	...
Wuhu	49.9*	42.8	...	...	74.7*	...	100.0*	...	...	...	...	...	100.0	...	...	...	...	...
Chekiang																		
Chinhai	100.0*	50.2	70.9*	...	...	...	95.3	61.8*	...	83.0*	...	100.0*	87.1*	89.2*	100.0*	...	77.0	...
Fukien																		
Lienkiang	99.7	42.6	...	100.0*	...	...	...	...	...	...	...	...	98.4	67.2	...	98.8*	82.7	...
Kiangsu																		
Kiangning (S)	90.2	62.9	...	...	95.4*	...	95.4	97.9	99.4	97.6*	...	99.1	...	53.5*	...	...	100.0	...
Kiangning (T)	53.3	16.5	...	...	58.9	33.1	89.9*	84.6	77.6*	85.0	...	88.6	...	...	100.0*	...	11.1*	...
Wuchin	44.4	28.3	...	...	1.4*	...	4.8*	80.2*	...	22.5*	...	67.2*	61.5*	78.7*	...	...	72.2*	...
Average by localities	*66.8*	*39.6*	...	...	*66.5*	*33.1*	*95.4*	*87.5*	*74.4*	*85.0*	...	*93.9*	*99.2*	*67.2*	...	...	*86.6*	...
Average by 17 localities	*52.5*	*38.4*	*21.9*	*26.6*	*63.7*	*26.4*	*95.4*	*44.0*	*51.7*	*46.0*	*22.4*	*78.6*	*99.1*	*31.1*	*30.8*	*64.3*	*73.7*	...

*Fewer than twenty farms have these items and therefore they have been excluded in computing the average.

TABLE 11—(Continued)

†The following crops occur for one or a few localities only and therefore have not been put in the main part of this table.

HWAIYUAN:	DYE: Indigo, 0.9*; SEEDS, *Leguminous*: Peanuts, 3.5*; *Intertilled*: Wheat and field peas, 17.8; VEGETABLES: Carrots, 50.5*; FRUITS: Muskmelons, 95.2*; watermelons, 100.0*.
SU:	SEEDS, *Grains*: Hulless barley, 37.0*; *Leguminous*: Peanuts, 74.7; *Intertilled*: Wheat and field peas, 17.9; VEGETABLES: Onions, 100.0*; squash, 31.3*; carrots, 28.3*; red turnips, 69.4*; FRUITS: Watermelons, 63.2*; OTHERS: Sugar cane, 100.0*; tobacco, 36.6*.
PINGSIANG:	DYE: Indigo, 100.0*.
YENSHAN (1923):	FIBER: China jute, 23.5*; SEEDS, *Grains*: Proso millet, 60.6; *Leguminous*: Soybeans (green), 47.8*; FORAGE: Alfalfa, 2.9*; OTHERS: Tobacco, 57.5.
SINCHENG:	SEEDS, *Grains*: Buckwheat, 18.4; *Leguminous*: Peanuts, 47.4*; red beans, 28.6*; FRUITS: Watermelon seeds, 93.4; miscellaneous melons, 100.0*; muskmelons, 100.0*.
KAIFENG:	SEEDS, *Grains*: Proso millet, 24.8; *Leguminous*: Red beans, 6.5*; FRUITS: Watermelons, 92.0*; muskmelons, 88.2*.
WUSIANG:	SEEDS, *Grains*: Proso millet, 54.3; buckwheat, 62.4; FRUIT: Watermelon, 96.4*; OTHERS: Willow, 100.0*.
WUTAI:	SEEDS, *Grains*: Proso millet, 30.6; oats, 26.7 ROOTS: Irish potatoes, 68.1.
LAIAN (1921):	SEEDS, *Leguminous*: Red beans, 47.6*; *Intertilled*: Wheat and field peas, 44.8; melon and squash, 58.8*; Corn and Soybeans, 42.6.
WUHU:	SEEDS, *Intertilled*: Wheat and broad beans, 23.1*.
CHINHAI:	SEEDS, *Leguminous*: Broad beans, 43.3; cowpeas, 83.8*; *Grains*: Wild rice, 100.0*; TUBERS: Taro, 91.5; squash, 95.6*; FRUITS: Melons, 92.2*.
LIENKIANG:	ROOTS: Taro, 87.4*.
KIANGNING (S):	SEEDS, *Grains*: Barley (hulless), 96.2; *Leguminous*: Red beans, 100.0*; FRUITS: Watermelons, 87.7*.
KIANGNING (T):	SEEDS, *Leguminous*: Red beans, 100.0*; cowpeas, 82.2*; broad beans, 88.4; FRUITS: Watermelons, 91.5*; muskmelons, 87.5*; TUBERS: Taro, 75.0; VEGETABLES: Turnip, 91.7*.
WUCHIN:	SEEDS, *Leguminous*: Broad beans, 10.9; red beans, 60.0*; TUBERS: Arrowhead, 53.0*; taro, 62.9; FRUITS: Watermelons, 88.9*.

Other cash crops important in geographical distribution as well as in proportions sold are green beans, rice, millet, and kaoliang.

On the other hand, there are a number of crops which are raised only for sale but they occur in fewer than twenty farms in any one region. Some of these are melons, sugar cane, indigo, basket willow, wild rice, and red beans.

A common observation is that the farmer eats inferior grains and sells the high grade products. In North China farmers eat kaoliang and sell their wheat. The portion of the kaoliang sold is 22 as compared with 53 per cent for wheat.

In the rice districts where wheat is also grown the portion of the wheat crop sold is two-thirds, while of the rice only 38 per cent is sold. This shows that wheat is more of a cash crop than rice because rice is the preferred food in rice-growing districts.

TABLE 12. CROPS RANKED BY PROPORTION OF THE TOTAL CROP SOLD

2866 farms, 17 localities, seven provinces, China (1921-1925)

Crops	Number of localities selling the crop	Per cent of total crop sold
Rapeseed	3	99.1
Barley (hulless)	1	96.2
Glutinous rice	2	95.4
Watermelon seeds	1	93.4
Sesame	6	78.6
Taro	2	77.2
Peanuts	1	74.7
Vegetables	5	73.7
Irish potatoes	1	68.1
Hemp	4	64.3
Barley	4	63.7
Tobacco	1	57.5
Wheat	15	52.5
Green beans	7	51.7
Broad beans	3	47.5
Field peas	3	46.0
Soybeans	10	44.0
Proso millet	4	42.6
Buckwheat	2	40.4
Rice	9	38.4
Sweet potatoes	5	31.1
Cotton	2	30.8
Wheat and field peas	3	26.8
Oats	1	26.7
Millet	8	26.6
Corn	4	26.4
Soybeans (black)	3	22.4
Kaoliang	9	21.9

CROP YIELDS

The quality of the farm business is an essential factor in determining a successful farm business, and quality is revealed by the yield of crops which in turn reflects the natural productivity of the soil as well as the care given the soil by tillage, by fertilization, and by maintenance of optimum moisture content. Yield is also determined by the pedigree of the seed or plant as well as the crop's protection from insects and diseases and other care, such as pruning.

Yields of Important Crops

Efficiency of farming between localities or between countries cannot be compared on the basis alone of crop yields

TABLE 13. AVERAGE YIELD PER HECTARE OF THE IMPORTANT CROPS (IN QUINTALS)† AND ALSO IN BUSHELS PER ACRE FOR THE AVERAGE OF 17 LOCALITIES

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Seeds														Tubers	Fibers	
	Grains							Legumes intertilled with grains	Legumes				Oil seeds				
	Wheat	Rice	Kaoliang	Millet	Barley (hulled and hulless)	Corn (shelled)	Glutinous rice	Corn and soybeans	Soybeans	Green beans	Field peas	Soybeans (black)	Sesame	Rapeseed	Sweet potatoes	Cotton (with seed)	Hemp
North China																	
Anhwei																	
Hwaiyuan	5.63	5.76	7.26	4.01	3.51	...	...	...	3.38	4.26	...	...	2.63	3.87*	27.54	6.01	11.52
Su	6.33	...	11.01	9.62	7.22	...	...	...	4.43	4.43	11.14	6.46*	3.67	...	85.95	5.57	4.18
Chihli																	
Pingsiang	15.91	...	6.01	12.91	17.50	...	...	...	10.25*	...	...	10.61	...	...	...	...	9.37
Yenshan (1922)	10.40	...	7.68	12.51	...	6.44	...	3.47 1.86	2.60	4.09*	...	2.60*	...	...	7.43*	...	...
Yenshan (1923)	0.74	...	4.33	16.10	...	5.20	...	2.60 2.48	3.59	4.95*	...	3.47	...	...	...	...	...
Honan																	
Sincheng	9.32	...	11.04	8.46	7.46	10.32	...	...	9.46	9.61	9.61*	9.61	3.44	...	50.90	...	...
Kaifeng	8.61	...	24.47	20.68	12.06	7.93	...	2.41 5.86	7.41	8.10	...	...	5.69	...	75.29	6.55	6.55
Shansi																	
Wusiang	11.37	...	13.06	13.21	12.44	...	...	...	9.22*	11.22*	...	...	...	8.91	...	*2.61**	3.38
Wutai	8.54	...	19.49	18.69	...	...	...	...	8.54	12.57*	4.83	...	...	...	...	...	10.79*‖
Average by localities	*8.54*	*5.76*	*11.59*	*12.91*	*10.03*	*7.47*	...	*2.83* *3.40*	*5.63*	*6.60*	*7.99*	*7.90*	*3.86*	*8.91*	*59.92*	*6.04*	*7.09*

(Continued)

TABLE 13.—(Continued)

Provinces and hsiens in which studies were made	Seeds													Tubers	Fibers	
	Grains							Legumes intertilled with grains	Legumes				Oil seeds			
	Wheat	Rice	Kaoliang	Mille	Barley (hulled and hulless)	Corn (shelled)	Glutinous rice	Corn and soybeans	Soybeans	Green beans	Field peas	Soybeans (black)	Sesame	Rapeseed	Sweet potatoes	Cotton (with seed)	Hemp
East Central China																	
Anhwei																	
Laian (1921) ..	11.60	25.01	...	...	12.14*	...	19.21*	11.96§	9.60	11.96	...	...	7.97*	11.78*	80.10*	3.62	8.70*
Laian (1922) ..	9.79	13.77	...	...	26.82	19.39*	7.97*	...	19.39	22.65	21.20*	...	14.50*	13.05*	32.44*	4.71*	*72.31¶
Wuhu	8.90	35.43	...	...	13.19*	...	34.54*	...	...	...	...	...	...	8.90	...	...	...
Chekiang																	
Chinhai	11.81*	39.90	...	...	...	...	36.71	...	11.81*	...	14.20*	...	...	8.46*	135.97*	9.58*	...
Fukien																	
Lienkiang	25.68	81.95‡	14.01*	21.01*	...	...	...	...	...	...	...	...	...	23.11	102.73	...	35.72*
Kiangsu																	
Kiangning (S)..	6.84	33.82	...	...	16.91*	...	45.76	...	8.99	10.74	...	...	8.49	...	101.18*	0.94*	...
Kiangning (T)..	8.04	15.25	...	...	9.68	12.14*	26.90*	8.53 5.74	8.36	...	9.68	...	4.10*	...	31.33*	3.94*	...
Wuchin	6.96	35.76	...	...	4.59	...	39.10	...	20.73*	...	10.30	...	10.30*	...	...	...	...
Average by localities	*11.12*	*28.42*	...	...	*13.70*	...	*40.52*	*8.53* *5.74*	*11.59*	*15.12*	*9.99*	...	*3.49*	*16.01*	*102.73*	*3.62*	...
Average by 17 localities ..	*9.67*	*25.59*	*11.59*	*12.91*	*11.25*	*7.47*	*40.52*	*4.25* *3.99*	*7.80*	*10.25*	*8.99*	*7.90*	*3.78*	*13.64*	*68.48*	*5.44*	*7.00*
Average by 17 localities (bushels per acre)	*14.9*	*51.9*	*18.5*	*23.0*	*17.7*	*11.9*	*80.4*	*6.8* *6.4*	*12.4*	*14.8*	*13.4*	*12.6*	*7.0*	*24.4*	...	...	...

*This yield is for less than twenty farms and has not been included in the average.

†One quintal is equivalent to 100 kilograms, or 220.46 lbs.

‡This yield is the total for early and late rice, the latter being planted between the rows of early rice, and has been omitted from the average

§The first figure for each place is the yield of corn and the second is the yield of soybeans for the same locality, with the exception of Laian (1921) where the yields were not separated by the investigator.

¶Lint only.

**Hemp seed.

TABLE 13—(Continued)

Yields for crops occurring in a few localities only are as follows:

HWAIYUAN:	Wheat and field peas, 4.88; peanuts, 14.40; vegetables, 121.43; indigo, 13.90.
SU:	Wheat and field peas, 8.86; peanuts, 25.82.
PINGSIANG:	Kaoliang (5.48) and soybeans (black), (2.30); vegetables, 107.50.
YENSHAN (1923):	Jute, 1.98.
SINCHENG:	Buckwheat, 8.32; Watermelons seeds, 4.45.
KAIFENG:	Sesame (1.21) and green beans, (7.24); red beans, 10.17; proso millet, 8.79; vegetables, 71.85.
WUSIANG:	Buckwheat, 8.30; kaoliang (11.06) and green beans (10.45); squash and potatoes (sweet), 114.61; proso millet, 12.29.
WUTAI:	Irish potatoes, 114.06; oats, 9.99; proso millet, 17.72.
LAIAN (1921):	Wheat and field peas, 15.04; vegetables, 45.49.
LAIAN (1922):	Vegetables, 115.44.
WUHU:	Wheat and field peas, 8.90.
CHINHAI:	Broad beans, 9.89; pei cha, 200.77.
LIENKIANG:	Vegetables, 55.01.
KIANGNING (S):	Barley hullness, 7.38; vegetables, 350.11.
KIANGNING (T):	Broad beans, 11.65; vegetables, 113.17.
WUCHIN:	Broad beans, 10.58; *Astragalus sinensis*, 81.27.

because of the many variable factors affecting yields, such as soils, climate, topography, and insect pests.

This holds all the more true in any year to year comparisons. For instance, the yield of wheat at Yenshan Hsien, Chihli (1923), was almost a failure because of drought. Rice at Hwaiyuan Hsien, Anhwei, shows a much lower yield than for the other regions, partly because the year was not very favorable and partly because the conditions in that locality are primarily not favorable for rice. The crop was five-eighths of an average yield. The yields of the more important crops for the year studied are shown in table 13.

In order to measure these variations between localities a crop index has been computed, using, in the first instance, the average yields for North China as 100 and then comparing each North China locality with this base; the same has been done for the East Central China localities, with the average for all these localities as 100. Then another crop index figure has been obtained for each of the seventeen localities, using the average yields for all localities as 100. These data (table 14) may be used to indicate the relative productivity of the locality and of the year.

TABLE 14. A COMPARISON OF YIELDS BETWEEN LOCALITIES AND WITH NORMAL YIELDS FOR THE SAME LOCALITY*

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Crop index (when the average yields of North China and East Central China are used as 100 respectively)	Crop index (when the average yield of 17 localities is used as 100)	Crop yields obtained in the year studied compared with normal yields (per cent)
North China			
Anhwei			
Hwaiyuan	73	61	60
Su	91	82	80
Chihli			
Pingsiang	123	118	80
Yenshan (1922)	85	74	80
Yenshan (1923)	74	57	40
Honan			
Sincheng	109	96	80
Kaifeng	130	117	100
Shansi			
Wusiang	103	95	80
Wutai	116	108	90
Average, North China	*100*	...	...
East Central China			
Anhwei			
Laian (1921)	92	109	80
Laian (1922)	130	173	80
Wuhu	87	98	80
Chekiang			
Chinhai	116	124	90
Fukien			
Lienkiang	158	195	100
Kiangsu			
Kiangning (S)	91	105	80
Kiangning (T)	81	113	50
Wuchin	84	93	80
Average, East Central China	*100*	...	...
Average, 17 localities	...	*100*	...

*A normal yield is taken as one hundred. An average yield is usually about 80 per cent of normal. Estimates have been made, with a few exceptions, from supplementary data supplied by the investigator regarding the crop year compared with normal.

Farming in China is often spoken of as being intensive[1] but one is surprised to find that the wheat yield for the localities

[1]The term "intensive" is used in the sense that additional amounts of labor or capital increase production.

15. *A grapevine near Hwailai, Chihli. The development of the fruit industry is one way of enlarging the farm business in China.*

16. *In raising the small Chinese peanut, the topsoil of the entire field must be sifted in order to separate the peanuts from the soil.*

studied is approximately the same as the average wheat yield for the United States, where farming is supposed to be extensive (fig. 2). Wheat in China is grown a little more intensively than in the United States, for the crop is usually cultivated at least once and sometimes twice during the season and in some regions may even be fertilized more than once. On the other hand, climatic conditions are possibly more favorable in the United States for wheat than they are in China. Other differences which might affect yield are the broadcasting of wheat in China south of the Hwai River and in North China where the wheat is drilled in rows three to four inches wider apart than in most regions in the United States. Then, again, much of the wheat in East Central China is grown as a winter crop in rice paddy fields, often poorly drained, as a secondary crop; in such fields raised beds two to four feet wide are made for planting wheat and the ditches between are, of course, unproductive, but even so the yields are as good as, and often better than in North China where wheat is commonly the main crop.

Rice, however, shows a 52 per cent higher crop yield for China than in the United States and this is partly because of the more intensive methods used in growing it. Rice in China is cultivated several times during the season and at times much labor and expense is used to add organic matter to the rice paddy fields. Whether climate is more favorable for rice in China than in the United States requires investigation. The yields of rice in Japan where climatic and soil conditions are probably no more favorable than in China are one-fifth greater because of the more intensive methods used. Corn yields in the China localities studied are less than one-half of the average yield in the United States where the greater proportion of the world's corn is produced. Corn in China is grown much less extensively than kaoliang and gives lower yields, partly, at least, because of inferior seed and methods. The climate in large areas of China appears to be favorable to corn production and since corn is a better food than kaoliang the possible extension of corn area should be considered. Sweet potatoes are another crop giving much higher yields in China compared with the United States, the yield is 2-8 times greater. One cause for this may be the large amount of labor used in China to turn the vines frequently to keep them from rooting. Another cause is a possible difference in soils.

Fig. 2.—A comparison of yields of crops in China with yields in other countries.

The yields for China are the average of the seventeen localities in this study, while those for other countries are taken from the International Yearbook of Agricultural Statistics for 1923, published by the International Institute of Agriculture at Rome, and are for the year 1909-1913.

In summarizing the data on yields, it may safely be concluded that yields in China can easily be improved. Undoubtedly increases obtained from the use of better seed and the use of otherwise idle labor would be profitable immediately, while investment in fertilizer would tend to be profitable as prices of farm products increase.

A comparison of yields on small and large farms shows no significant difference (see table 22 and discussion under size of farm and quality of business, chapter IV).

Crop Yields and Operator's Labor Earnings

Operator's labor earnings for farms, when grouped by crop index, show that yields are an important factor in determining profits (table 15). These earnings are $53, $89, and $118 for farms having a low, medium, or high index, and are 2.2 times as great for the high as for the low crop index group. For North China the difference is only 1.4 times as compared with 2.9 times for East Central China. This difference may possibly be caused by the greater attention given to fertilization on the East Central China farms, where 4871 kilograms of manure and $3.67 worth of purchased fertilizer per hectare are used annually as compared with 2637 kilograms and $1.48 worth per hectare in North China.

This relationship of operator's labor earnings with the high crop indices holds true for all localities except Laian Hsien (1922), Anhwei, a region where little effort is made to improve yields. Good yields, then, as one measure of the quality of the farm business, is a determining factor in the amount of profits from the farm business.

Crop Yields and Net Profits per Crop Hectare

Net profits per crop hectare, like farm labor earnings, increase in the groups of farms having the larger yields (table 16). For all farms, those with the small, medium, and large crop indices have net profits per hectare of $–3.61, $13.78, and $25.91. The same relation holds for both North and East Central China. Localities that are exceptions and show little difference are Hwaiyuan Hsien, Anhwei, and Kaifeng Hsien, Honan. There is no significant correlation between crop yields and size of farm and it is improbable that any other factor is as

TABLE 15. RELATION OF CROP INDEX TO OPERATOR'S LABOR EARNINGS PER FARM

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Operator's labor earnings for farms in the specified crop index group				
	Small	Medium small	Medium	Medium large	Large
North China					
Anhwei					
Hwaiyuan	$-34.83	...	$ 11.54	...	$13.20
Su	40.94	$ 68.83	87.71	$ 65.92	101.47
Chihli					
Pingsiang	6.04	...	21.84	...	52.18
Yenshan (1922)	6.74	37.56	...	47.29	40.43
Yenshan (1923)	-35.53	...	-64.62	...	-95.16
Honan					
Sincheng	93.06	...	71.86	...	102.72
Kaifeng	190.26	...	180.96	...	156.39
Shansi					
Wusiang	41.79	46.60	...	56.10	62.04
Wutai	85.55	...	121.90	...	114.38
Average by localities	*43.78*	...	*57.00**	...	*60.85*
East Central China					
Anhwei					
Laian (1921)	-22.00	...	159.16	...	263.55
Laian (1922)	18.04	...	22.33	...	18.92
Wuhu	45.62	...	...	...	63.73
Chekiang					
Chinhai	108.53	134.58	...	122.17	170.90
Fukien					
Lienkiang	134.48	...	215.01	...	384.20
Kiangsu					
Kiangning (S)	186.72	209.77	...	334.95	345.66
Kiangning (T)	0.58	...	51.31	...	86.70
Wuchin	36.37	...	82.24	...	129.54
Average by localities	*63.67*	...	*130.28**	...	*182.90*
Average by 17 localities	*53.08*	...	*89.07**	...	*118.29*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

important as crop yields in accounting for this relation of greater net profits per crop hectare with the increase in crop yields.

Crop Yields and Value of Land per Hectare

The value of the land is usually a reflection of its productivity. A classification of all farms by low, medium, and

TABLE 16. RELATION OF CROP INDEX TO NET PROFITS PER CROP HECTARE

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Net profits per crop hectare for farms in the specified crop index group					
	Small	Medium small	Medium	Medium large	Large	Average for all farms
North China						
Anhwei						
Hwaiyuan	$–17.28	...	$–14.77	...	$–17.53	$–16.52
Su	–2.66	$2.03	6.58	$8.23	22.53	6.46
Chihli						
Pingsiang	–40.66	...	–4.07	...	1.24	–15.91
Yenshan (1922)	–7.68	0.25	...	6.19	11.39	3.47
Yenshan (1923)	–34.68	...	–15.36	...	–30.10	–25.64
Honan						
Sincheng	8.17	...	7.89	...	17.49	12.04
Kaifeng	16.54	...	16.88	...	21.19	18.26
Shansi						
Wusiang	–10.60	–12.75	...	–3.53	0.00	–69.1
Wutai	17.24	...	26.91	...	24.81	23.36
Average by localities	*7.96*	...	*2.00**	...	*5.67*	*–0.15*
East Central China						
Anhwei						
Laian (1921)	–17.04	...	19.93	...	56.18	19.03
Laian (1922)	–29.00	...	–17.94	...	–38.42	–27.73
Wuhu	–44.33	...	...	...	–23.28	–32.77
Chekiang						
Chinhai	20.59	27.13	...	12.29	54.42	29.05
Fukien						
Lienkiang	61.17	...	115.11	...	222.51	141.96
Kiangsu						
Kiangning (S)	32.74	55.02	...	65.62	67.77	54.21
Kiangning (T)	–25.42	...	–9.68	...	2.46	–12.47
Wuchin	11.55	...	28.81	...	47.73	31.59
Average by localities	*1.28*	...	*27.03**	...	*48.67*	*25.36*
Average by 17 localities	*–3.61*	...	*13.78**	...	*25.91*	*11.85*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

high land values shows a significant difference in yields. The crop index, a composite measure of yields for all crops, is 92.4, 100.1, and 109.9 for the three groups of land values (table 17 and fig. 3). North and East Central China show about the same proportionate difference also. Some localities show still greater variation because productivity of land varies a great

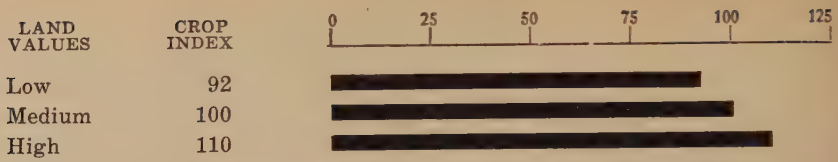

Fig. 3.—The relation between land values and crop yields.
2866 farms, 17 localities, seven provinces, China (1921-1925).

deal within the locality. For example, at Su Hsien, Anhwei, the crop indices for the three groups of land values are 86.8, 101.0, and 128.5. The low land, subject to floods and already described under cropping systems, accounts chiefly for this difference. In Yenshan Hsien (1923), Chihli, the difference is chiefly its low lying, alkali land. Other regions, like Wuhu, Anhwei, and Wutai Hsien, Shansi, have nearly the same crop index for the three value groups because the actual land values between the groups do not vary greatly.

Land Values and Operator's Labor Earnings

Operator's labor earnings for the farms grouped by land values show no significant difference between the low and high land values (table 17). The average of such earnings for the three groups are $90 for the low land values, $92 for the medium, and $86 for the high land values. The relationship for North and East Central China, however, when taken separately, shows decided tendencies in opposite directions. In North China the operator's labor earnings average $75, $40, and $46 respectively, while in East Central China they average $108, $144, and $131 for the low, medium, and high land values. In all the localities of North China except Pingsiang Hsien, Chihli, the farms of low land values have higher operator's labor earnings than do the farms of high land values. In East Central China the reverse is true for five out of eight places. Evidently, for localities where the relationship is marked, land values are an important factor in determining operator's labor earnings.

PRICES OF CROPS

The prices of crops vary, like yields, with the year (table 18). Since the studies for different localities cover a period of years from 1921 to 1925 and the studies for different localities have been made in different years, it is important to have an

17. *Sheep are raised quite extensively in Shansi to graze on the untillable land.*

18. *The donkey is commonly used as a draft animal in North China. Here, in Lin I Hsien, Shantung, kaoliang is being sown with a two-row drill. Some drills are three-rowed. The drill, although one of the greatest labor-saving devices on the farms of China, is found only in North China.*

19. *Packing the light, dry soil in the drilled rows of kaoliang, Lin I Hsien, Shantung.*

TABLE 17. VALUE OF LAND IN RELATION TO CROP INDEX AND OPERATOR'S LABOR EARNINGS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Farms grouped by land values per local mow*			Crop index for farms having			Operator's labor earnings for farms in the group having		
	Low land values	Medium land values	High land values	Low land values	Medium land values	High land values	Low land values	Medium land values	High land values
North China									
Anhwei									
Hwaiyuan	$13.28	$16.94	$23.17	90.2	103.0	112.0	$13.17	$–9.05	$–12.94
Su	17.59	25.61	36.12	86.8	101.0	128.5	104.55	54.66	68.49
Chihli									
Pingsiang	16.74	32.81	59.24	84.0	96.6	116.4	9.67	29.91	44.78
Yenshan (1922)	14.44	...	23.51	95.0	...	110.0	46.46	...	32.89
Yenshan (1923)	14.34	26.79	40.56	77.3	96.9	109.9	–13.16	–70.42	–106.22
Honan									
Sincheng	36.54	45.79	52.28	91.1	102.2	108.6	107.68	69.24	96.04
Kaifeng	28.37	...	32.07	95.3	...	105.4	240.10	...	147.08
Shansi									
Wusiang	15.42	20.42	25.99	93.5	101.1	101.1	58.10	91.30	46.68
Wutai	11.89	13.50	15.44	97.1	101.9	99.6	109.17	117.00	96.88
Average by localities	...	...	...	*90.0*	*100.4*	*110.2*	*75.08*	*40.38*	*45.96*
East Central China									
Anhwei									
Laian (1921)	17.01	20.03	27.27	89.3	98.7	108.8	81.39	152.36	134.72
Laian (1922)	19.49	...	29.46	97.2	...	140.2	21.07	...	15.95
Wuhu	98.00	114.00	139.00	101.2	102.1	102.5	88.10	30.40	10.78
Chekiang									
Chinhai	23.82	65.75	172.09	97.7	101.3	100.3	171.09	127.07	113.71
Fukien									
Lienkiang	55.64	72.99	93.08	94.4	96.9	103.9	184.24	313.79	289.43
Kiangsu									
Kiangning (S)	48.00	55.09	63.71	93.3	95.6	113.4	234.12	247.89	292.21
Kiangning (T)	31.06	38.73	49.36	92.3	107.3	102.7	32.57	43.54	50.62
Wuchin	40.87	46.60	53.35	94.6	96.7	105.6	47.69	89.76	143.89
Average by localities	...	...	...	*95.0*	*99.8*	*109.7*	*107.53*	*143.54*	*131.41*
Average by 17 localities	...	...	...	*92.4*	*100.1*	*109.9*	*90.35*	*91.96*	*86.18*

*Values and averages per hectare are given in table 25, Chapter IV.

index number of changes in price level during this five-year period. Because of this, producers prices for the years 1921 to 1925 have been obtained from merchants in the localities studied, and these prices have been computed into index numbers (table 19). These prices are given in order to make them available for any who wish to make a special study of the influence of a changing price level upon the comparisons between the different localities. Only three localities show a greater difference than 10 per cent for the year studied compared with the base year.

TABLE 18. AVERAGE PRICES PER QUINTAL§ (CHINESE CURRENCY) RECEIVED BY FARMERS FOR CROPS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Seeds: Grains: Wheat	Rice	Kaoliang	Millet	Barley	Corn	Glutinous rice	Legumes with intertilled crops: Corn and soybeans	Legumes: Soybeans	Green beans	Field peas	Soybeans (black)	Oil seeds: Sesame	Rapeseed	Tubers: Sweet potatoes	Fibers: Cotton (with seed)	Hemp (various kinds)	Vegetables (miscellaneous)	Fruits
North China																			
Anhwei	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Hwaiyuan	3.47	4.80	2.57	6.04	4.20	...	...	...	6.59	5.41	...	...	10.19	7.67	0.75	17.85	13.47	0.92	...
Su	6.29	4.36	3.31	3.71	3.87	2.98	...	...	5.52	5.94	5.16	5.08	12.89	...	1.68	16.81	16.92	1.69	...
Chihli																			
Pingsiang	8.48	...	5.52	6.19	7.73	...	...	...	7.73	...	...	7.73	11.60	...	...	...	67.02	1.06	...
Yenshan (1922)	7.10	...	3.71	4.32	...	4.35	...	...	4.28	4.38	...	4.85	...	...	1.68	...	...	0.77	5.50‡
Yenshan (1923)	7.44	...	4.50	5.59	...	5.35	...	...	5.64	4.90	...	4.92	...	...	...	...	...	1.27	...
Honan																			
Sincheng	6.61	...	4.79	5.37	4.79	5.14	...	...	5.48	5.20	5.11	5.48	12.23	...	1.69	...	...	1.39	...
Kaifeng	8.64	...	5.01	4.94	5.09	4.88	...	...	5.78	5.34	4.83	...	11.69	...	2.38	34.42	32.36	2.50	...
Shansi																			
Wusiang	4.86	...	3.53	5.30	2.82	2.82	...	...	3.32	3.18	3.10	3.63	...	6.77	...	91.86*	33.46†	0.92	1.51
Wutai	9.06	...	3.24	2.68	8.21	...	...	...	4.50	4.20	6.39	...	...	4.20	...	...	4.27	...	...
Average by localities	*6.88*	*4.53*	*4.02*	*4.90*	*5.24*	*4.25*	...	...	*5.43*	*4.82*	*4.92*	*5.28*	*11.72*	*6.21*	*1.64*	*23.03*	*27.92*	*1.32*	...
East Central China																			
Anhwei																			
Laian (1921)	6.30	6.40	...	7.31	4.62	4.92	7.19	6.64	7.06	6.28	3.00	...	11.74	9.35	1.31	35.59	8.90	...	...
Laian (1922)	5.27	5.86	...	...	3.87	5.89	7.46	...	6.42	5.90	4.70	...	10.24	8.27	1.68	33.71	3.70	2.23	...
Wuhu	8.21	5.09	...	...	5.40	...	6.55	...	...	...	...	...	...	8.38	...	...	...	...	...
Chekiang																			
Chinhai	5.80	5.38	4.44	...	...	...	6.85	...	5.71	...	5.14	...	9.30	7.10	1.98	20.88	...	3.20	...
Fukien																			
Lienkiang	10.44	6.99	8.38	10.05	...	...	...	...	...	...	...	...	...	9.80	2.25	...	11.21	2.48	...
Kiangsu																			
Kiangning (S)	4.77	5.48	...	...	7.26	...	7.99	...	7.96	7.55	6.21	...	13.28	...	1.81	16.29	...	3.28	...
Kiangning (T)	5.72	5.03	...	...	4.61	5.40	6.56	...	6.85	5.83	6.15	...	17.21	...	2.25	...	...	1.68	...
Wuchin	5.91	6.07	...	...	4.85	...	6.09	...	8.81	...	6.74	...	14.70	3.02	...	...	...	2.48	...
Average by localities	*6.55*	*5.79*	*6.41*	*8.68*	*5.10*	*5.40*	*6.96*	*6.64*	*7.14*	*6.39*	*5.32*	...	*12.75*	*7.65*	*1.88*	*26.62*	*7.94*	*2.56*	...
Average by 17 localities	*6.73*	*5.55*	*4.45*	*5.59*	*5.18*	*4.64*	*6.96*	*6.64*	*6.11*	*5.34*	*5.14*	*5.28*	*12.28*	*7.17*	*1.77*	*25.03*	*21.26*	*1.85*	...

*Ginned and carded.
†With seed.
‡Jujubes.
§One quintal is equivalent to 100 kilograms, or 220.46 pounds.

20. *Some of the tools used for threshing near Nanking. Right to left: a bamboo broom, a small rake, a large scoop, a fork, a wooden shovel, a pusher, a flail, a bamboo rake, a stone roller.*

21. *The carrying of crops from the field to the threshing floor in East Central China consumes much time and energy.*

22. *Even farm tools such as the plow are carried to the field. The Chinese farmer objects to the heavy foreign plow therefore because it is heavy to carry. The field at the right has been plowed and ridged ready for planting wheat.*

TABLE 18—(Continued)

The following crops occur for one or at most several localities and therefore have not been included in the main part of this table.

HWAIYUAN:	Carrots, $0.80; indigo, $8.95; peanuts, $6.89; watermelons, $3.08; muskmelons, $1.58; wheat and field peas, $5.69; small beans, $5.04.
SU:	Red beans, $5.33; proso millet, $3.96; Irish-potatoes, $1.68; peanuts; $6.89, watermelons, $1.84; squash, $0.03 (each); carrots, $0.84; wheat and field peas, $5.24; red winter radish, $1.14; sugar cane, $0.01 (each); hulless barley, $5.80; tobacco, $15.53; onions, $1.68; buckwheat, $3.74; broad beans, $4.12; barley and field peas, $3.44; hay, $1.34.
PINGSIANG:	Indigo, $21.15; broom millet, $6.18.
YENSHAN (1923):	Alfalfa, $2.01; proso millet, $4.16; china jute, $15.85; soybeans (green), $5.14; tobacco, $4.54; carrots, $3.35.
SINCHENG:	Buckwheat, $5.43; watermelon seeds, $16.76; peanuts, $8.71; red beans, $5.29.
KAIFENG:	Watermelons, $2.04; proso millet, $4.46; muskmelon, $1.83; red beans, $4.96.
WUSIANG:	Watermelons, $0.99; proso millet, $4.51, squash and sweet potatoes, $0.34; buckwheat, $3.06; willow, $21.98; white beans, $3.53.
WUTAI:	Proso millet, $3.68; Irish potatoes, $0.84; oats, $5.42.
LAIAN (1921):	Wheat and field peas, $6.30; melons and squash, $3.60; red beans, $6.92.
WUHU:	Wheat and field peas, $6.82; wheat and broad beans $8.38.
CHINHAI:	Broad beans, $6.22; taro, $2.58; cowpeas, $5.86; watermelons, $4.71; squash, $5.03; wild rice, $9.05; onions, $9.22.
LIENKIANG:	Taro, $3.55.
KIANGNING (S):	Barley (hulless), $5.34; red beans, $7.98; watermelons, $4.19.
KIANGNING (T):	Red beans, $6.49; broad beans, $5.53; turnips, $2.51; cowpeas, $1.68; watermelons, $3.28; muskmelons, $3.35; taro, $2.51.
WUCHIN:	Broad beans, $5.71; watermelons, $2.58; arrowhead, $14.58; taro, $3.32; red beans, $11.81.

There is a great difference between localities in the copper price of a commodity, but when such prices are reduced to a silver basis, the difference seems to be largely one of transportation and other costs usual between producing and consuming regions.

A study of comparative prices (table 20) for several products common to both China and the United States shows a surprisingly small difference in value per unit. This seems to indicate that the high or low cost of labor is not the determining factor in prices of many agricultural commodities in the two countries. It explains why wheat can be imported to China from Canada or the United States. With sweet potatoes the situation is different partly because of the great demand in the United States in relation to the supply and also because of the larger amount of hand labor required than for such grains as wheat, thus greatly increasing the comparative cost of production in the United States where labour is expensive.

TABLE 19. INDEX OF PRICES (IN SILVER) OF FARM PRODUCTS FOR THE YEARS 1921-1925*

Seventeen localities, seven provinces, China

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	INDICES FOR THE SPECIFIED YEARS					Per cent increase or decrease for the year studied compared with the base year, 1923
	1921	1922	1923	1924	1925	
North China						
Anhwei						
Hwaiyuan	182	104	100	118	129	+26.3
Su	105	99	100	96	106	−2.7
Chihli						
Pingsiang	117	102	100	97	109	−0.3
Yenshan (1922) ..	96	97	100	152	174	−2.2
Yenshan (1923) ..	96	97	100	152	174	+13.0
Honan						
Sincheng	114	102	100	110	108	+2.5
Kaifeng	104	108	100	104	115	+2.3
Shansi						
Wusiang	110	98	100	131	127	−2.0
Wutai	83	88	100	122	133	−6.0
Average						
East Central China						
Anhwei						
Laian (1921) ..	92	102	100	96	116	−3.8
Laian (1922) ..	92	102	100	96	116	+1.2
Wuhu*	...	...	...	...	...	...
Chekiang						
Chinhai	85	96	100	103	97	−12.3
Fukien						
Lienkiang	...	...	...	...	...	...
Kiangsu						
Kiangning (S) ..	97	103	100	100	101	0.0
Kiangning (T) ..	97	103	100	100	101	0.0
Wuchin	98	102	100	109	112	7.2

*Indices in bold face type are for the years (or part of two years) during which data were collected. Price data for this five years period have been obtained largely from merchants buying products from the farmer. The year 1923 is selected as the base year because it is the year more studies were made than in any other. The drought of 1920-1921 is responsible for the high prices in North China in 1921.

TABLE 20. COMPARATIVE PRICES PAID PRODUCERS IN CHINA AND IN THE UNITED STATES*

PRODUCTS	China	United States	PRODUCTS	China	United States
Wheat	$6.73	$7.98	Kaoliang	$4.02	...
Rice	5.55	5.73	Sweet potatoes ..	1.77	$9.49
Corn	4.64	5.37	Cotton	25.08	47.40

*The prices for China are for the 2866 farms studied in 17 localities of seven provinces during the period of 1921-1925. The prices for United States of America are the average prices for all states for the years 1921-1925 but changed to Chinese currency at the rate of $1.00 Gold to $1.87 silver.

The material presented upon crops in this chapter shows the great predominance of grain and other crops grown for the kernels. The yields reveal a system of farming not so intensive in many localities as the casual observer has been led to believe. Yields are no better on small farms than on large ones except as the land may be better. There are, however, increased yields on land having the higher values. More diversification of crops, more intensive crops, such as tubers and fruits, more intensive methods with some of the crops already grown, such as the use of more fertilizer and the extension of irrigation and drainage, are all factors which can be utilized to increase production.

CHAPTER VII

LIVESTOCK AND FERTILITY MAINTENANCE

The purposes for which livestock are kept denote to a certain extent the character of the agriculture of a country. If livestock is raised largely for draft animals, then little meat is

TABLE 1. NUMBER OF EACH KIND OF LIVESTOCK FOR ALL FARMS
2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	LABOR ANIMALS					PRODUCTIVE ANIMALS					
	Oxen	Donkeys	Waterbuffaloes	Mules	Horses	Chickens	Sheep	Hogs	Ducks	Goats	Geese
North China											
Anhwei											
Hwaiyuan	91.0	90.0	2.0	5.5	17.0	218.0	...	64.0	2.0	...	1.0
Su	346.5	221.0	...	13.0	54.5	3619.0	...	154.0	176.0	122.0	22.0
Chihli											
Pingsiang	47.0	3.0	...	5.0	...	657.0	...	23.0	...	...	...
Yenshan (1922)	35.5	97.3	...	8.0	2.5	847.5	...	28.5	8.0	...	...
Yenshan (1923)	45.0	87.5	...	10.5	8.0	548.5	...	15.0	...	...	...
Honan											
Sincheng	114.5	80.5	...	10.0	20.5	1440.0	...	53.0	1.0	71.5	...
Kaifeng	127.0	97.0	...	60.5	15.5	966.5	193.0	88.0	...	...	...
Shansi											
Wusiang	36.7	74.0	...	19.7	11.0	663.0	654.0	43.0	38.5	127.5	...
Wutai	202.5	176.5	...	147.5	1.0	19.5	5324.5	82.5	...	167.0	...
Total	*1045.7*	*927.3*	*2.0*	*279.2*	*130.0*	*8979.0*	*6171.5*	*551.0*	*225.5*	*488.0*	*23.0*
Average, North China	*0.6*	*0.6*	—	*0.2*	*0.1*	*5.6*	*3.8*	*0.3*	*0.1*	*0.3*	—
East Central China											
Anhwei											
Laian (1921)	4.0	65.5	113.5	1.0	9.0	1144.5	...	305.0	250.5	1.5	...
Laian (1922)	...	35.5	92.5	4.0	3.0	821.0	...	171.0	19.5	...	77.5
Wuhu	34.0	...	87.0	...	...	1020.0	1.0	142.0	7.5	...	...
Chekiang											
Chinhai	50.0	1.0	...	...	...	508.0	0.5	51.0	23.5	...	7.0
Fukien											
Lienkiang	113.0	...	10.0	...	...	829.5	0.5	382.0	162.0	15.0	5.5
Kiangsu											
Kiangning (S)	108.5	...	65.0	...	...	1508.0	16.0	190.5	12.5	...	2.0
Kiangning (T)	53.0	14.0	31.0	...	...	1682.0	...	54.0	1.0	...	7.5
Wuchin	23.5	...	168.5	...	...	2048.0	287.0	698.0	102.0	...	3.0
Total	*386.0*	*116.0*	*567.5*	*5.0*	*12.0*	*9561.0*	*305.0*	*1993.5*	*578.5*	*16.5*	*102.5*
Average, East Central China	*0.3*	*0.1*	*0.5*	—	—	*7.6*	*0.2*	*1.6*	*0.5*	—	*0.1*
Total by 17 localities	*1431.7*	*1043.3*	*569.5*	*284.7*	*142.0*	*18540.0*	*6476.5*	*2544.5*	*804.0*	*504.5*	*125.5*
Average, 17 localities	*0.5*	*0.4*	*0.2*	*0.1*	—	*6.5*	*2.3*	*0.9*	*0.3*	*0.2*	—

23 *Nightsoil of Nanking being loaded on to boats and taken to farms as much as eight or ten kilometers distant.*

24. *Ducks and geese often glean for the shattered rice. The farm building and the hills in the distance are typical of much of the region about Nanking.*

25. *Carrying day-old chicks and ducklings to market.*

found in the diet with the exception, possibly, of fish. The amount of livestock determines also to a large degree the extent to which the fertility of the land is maintained.

AMOUNT AND DISTRIBUTION OF LIVESTOCK

The total number of different kinds of animals for each locality is shown in table 1 and the percentage distribution for each kind in terms of animal units is given in table 2 and fig. 1. In the seventeen localities it is seen that over one-third of the animal units are oxen, one-fifth water buffaloes, nearly thirteen per cent donkeys, and nearly one-tenth hogs. With the exception of three farms having water buffaloes at Hwaiyuan Hsien, Anhwei, no water buffaloes are found in the

TABLE 2. THE PERCENTAGE DISTRIBUTION OF TOTAL ANIMAL UNITS FOR EACH KIND OF LIVESTOCK

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	PERCENTAGE DISTRIBUTION											
	Oxen	Water-buffaloes	Donkeys	Hogs	Sheep	Chickens	Mules	Horses	Goats	Geese	Ducks	Total percent
North China												
Anhwei												
Hwaiyuan ..	52.0	1.8	26.6	5.2	...	1.2	3.3	9.9	...	...	...	100
Su	58.0	...	18.8	4.1	...	5.4	2.3	9.2	1.8	0.1	0.3	100
Chihli												
Pingsiang ..	72.4	...	2.5	7.4	...	10.3	7.4	...	...	...	...	100
Yenshan (1922)	33.1	...	45.5	3.7	...	7.9	7.4	2.3	...	...	0.1	100
Yenshan (1923)	39.8	...	37.6	1.9	...	4.7	8.7	7.3	...	...	...	100
Honan												
Sincheng ..	53.3	...	18.2	3.9	...	6.7	4.7	9.9	3.3	...	...	100
Kaifeng	43.1	...	16.4	4.3	7.4	2.9	20.6	5.3	...	...	...	100
Shansi												
Wusiang ..	17.3	...	17.4	2.8	38.8	3.1	9.2	5.2	6.0	...	0.2	100
Wutai	17.5	...	7.6	1.2	59.4	...	12.7	0.1	1.5	...	...	100
Average by localities	*42.9*	*0.2*	*21.2*	*3.8*	*11.7*	*4.7*	*8.5*	*5.5*	*1.4*	—	*0.1*	*100*
East Central China												
Anhwei												
Laian (1921)..	1.5	63.6	12.2	13.6	...	4.3	0.4	3.4	0.1	...	0.9	100
Laian (1922)..	...	68.2	8.7	14.7	...	4.0	2.0	1.5	...	0.8	0.1	100
Wuhu	22.6	57.8	...	12.6	0.1	6.8	...	...	...	0.1	...	100
Chekiang												
Chinhai	77.2	...	0.8	13.6	0.1	7.8	...	...	...	0.1	0.4	100
Fukien												
Lienkiang ..	62.0	8.2	...	23.4	...	4.6	...	...	0.8	0.1	0.9	100
Kiangsu												
Kiangning (S)	42.9	38.7	...	11.4	0.9	6.0	...	...	...	...	0.1	100
Kiangning (T)	41.9	35.6	5.5	6.3	...	10.6	...	...	...	0.1	...	100
Wuchin	5.6	60.1	...	24.0	6.3	3.8	...	...	...	...	0.2	100
Average by localities	*31.7*	*41.5*	*3.4*	*15.0*	*0.9*	*6.0*	*0.3*	*0.6*	*0.1*	*0.1*	*0.4*	*100*
Average by 17 localities	*37.7*	*19.6*	*12.8*	*9.1*	*6.6*	*5.3*	*4.6*	*3.2*	*0.8*	*0.1*	*0.2*	*100*

North China localities, whereas in the East Central China localities both oxen and water buffaloes are found with a larger proportion, in terms of animal units, of water buffaloes. Water buffaloes are not, of course, adapted to North China since they prefer a warmer climate and water for wallowing. Donkeys, horses, and mules are much more prevalent in the North China localities than in those of East Central China. Donkeys are especially useful in North China where there is much pack-animal work to be done and where they may be used for milling purposes in addition to being one of the animals in a team. Horses are naturally more adapted to the cooler and dryer weather of the North, and mules are also confined to the North because they are not adapted to the work in the wet rice fields of East Central China. Hogs are common to both regions as are also chickens and, to a more limited extent, ducks and geese. Sheep are raised by a large number of farmers in the two Shansi localities.

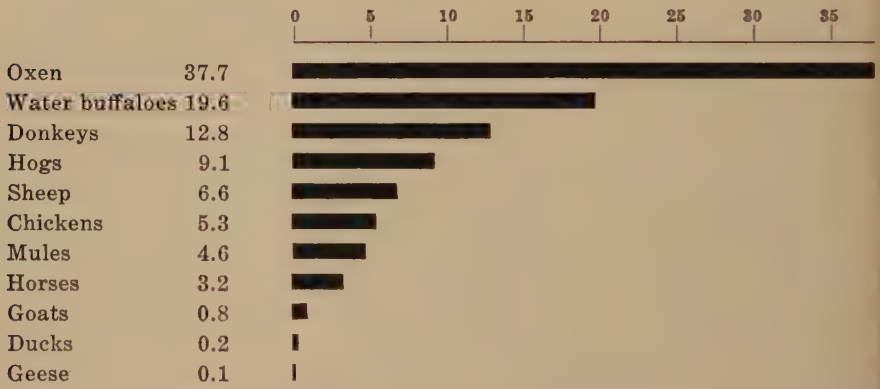

Fig. 1.—The percentage distribution of total animal units for each kind of livestock.

2866 farms, 17 localities, seven provinces, China (1921-1925).

The percentage of farms having the various animals is shown in table 3. In the seventeen localities chickens are found on 82 per cent of all farms and are the most common type of livestock. Hogs are next and are found on 45 per cent of the farms; oxen are third on 43 per cent of the farms. Donkeys are found on one-third of the farms. In North China one-half of the farms have oxen, whereas less than one-third have them in East Central China. Two-fifths of the farms have

26. *Both the old and the young spend much time in North China collecting droppings along the roadside for fertilizer. The small value placed on time is thus illustrated. The man has a typical outfit.*

TABLE 3. PERCENTAGE OF FARMS HAVING THE SPECIFIED ANIMALS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Labor animals					Productive animals					
	Oxen	Donkeys	Water buffaloes	Mules	Horses	Chickens	Hogs	Sheep	Ducks	Goats	Geese
North China											
Anhwei											
Hwaiyuan	65.3	70.2	2.4	4.8	14.5	64.5	51.6	...	1.6	...	0.8
Su	71.3	69.2	...	3.8	14.0	98.3	45.1	...	18.5	12.6	4.9
Chihli											
Pingsiang	27.6	2.0	...	2.0	...	88.8	14.5	...	...	...	...
Yenshan (1922)	24.7	64.0	...	4.7	2.0	94.0	14.0	...	5.3	...	...
Yenshan (1923)	33.8	58.6	...	8.3	6.0	88.0	11.3	...	...	...	...
Honan											
Sincheng	69.4	55.6	...	6.3	14.6	100.0	35.4	...	0.7	9.0	...
Kaifeng	83.2	64.4	...	26.8	11.4	100.0	61.7	30.2	...	...	...
Shansi											
Wusiang	41.8	55.8	...	13.1	4.8	68.1	14.3	24.7	6.0	14.7	...
Wutai	46.9	48.7	...	44.7	0.4	0.9	39.4	84.5	...	6.2	...
Percentage	*52.3*	*54.4*	*0.2*	*13.7*	*7.4*	*75.5*	*32.1*	*18.5*	*4.9*	*6.2*	*0.9*
East Central China											
Anhwei											
Laian (1921)	...	34.7	82.2	4.0	4.0	61.4	89.1	...	8.9	...	15.8
Laian (1922)	3.0	33.0	78.0	1.0	6.0	69.0	79.0	...	27.0	1.0	...
Wuhu	32.4	...	58.8	...	...	100.0	77.5	1.0	3.9	...	...
Chekiang											
Chinhai	50.7	1.5	...	...	...	89.6	41.8	1.5	17.9	...	9.0
Fukien											
Lienkiang	62.7	...	6.2	...	...	95.7	64.6	0.6	46.6	1.9	5.0
Kiangsu											
Kiangning (S)	52.7	...	29.1	...	...	99.5	70.4	6.9	2.5	...	1.5
Kiangning (T)	35.9	6.9	15.2	...	...	98.2	31.8	...	0.9	...	2.8
Wuchin	8.3	...	58.7	...	...	93.7	62.7	42.0	20.3	...	1.0
Percentage	*30.5*	*6.7*	*39.9*	*0.4*	*0.8*	*91.4*	*62.4*	*11.4*	*15.6*	*0.3*	*3.4*
Percentage by 17 localities	*42.7*	*33.6*	*17.5*	*7.9*	*4.5*	*82.4*	*45.3*	*15.4*	*9.6*	*3.6*	*2.0*

water buffaloes in East Central China. In North China over one-half of the farms have donkeys, 14 per cent of the farms mules, and 7.4 per cent horses.

Hogs are found on nearly two-thirds of the farms in East Central China but only on one-third of the farms of North China. Chickens also are more commonly found in East Central China than in North China. This is perhaps because of the nearness to markets. Ducks are much more common in East Central China where water is prevalent and where their feed may be obtained easily in the autumn after the rice is harvested. It is very common for ducks to pick up the fallen grains in the fields after the rice is harvested. At Hsinghua Hsien, Kiangsu, it is common for duck-herders to allow their flocks to roam the farmers' fields, a privilege which is obtained by

TABLE 4. DENSITY OF ANIMAL POPULATION

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Crop area (hectares) per animal unit	Crop hectares per animal unit	Total labor animal units	Total productive animal units	Total animal units	Per cent of productive animal units to total animal units
North China						
Anhwei						
Hwaiyuan	2.60	4.19	154.75	10.70	165.45	6.5
Su	2.28	3.69	491.13	67.84	558.97	12.1
Chihli						
Pingsiang	2.47	3.03	50.00	10.80	60.80	17.8
Yenshan (1922) ..	2.58	3.94	94.88	12.46	107.34	11.6
Yenshan (1923) ..	4.14	5.97	102.13	7.24	109.37	6.6
Honan						
Sincheng	2.13	3.61	175.00	28.28	203.28	14.6
Kaifeng	1.63	2.77	251.13	43.12	294.25	14.7
Shansi						
Wusiang	2.17	2.26	104.31	108.10	212.41	50.9
Wutai	1.60	1.60	439.25	718.16	1157.41	62.0
Total	...	...	*1861.08*	*1008.20*	*2869.28*	...
Average by localities	*2.40*	*3.45*	...	...	...	*21.9*
East Central China						
Anhwei						
Laian (1921) ..	1.50	1.78	217.00	50.51	267.51	18.9
Laian (1922) ..	1.24	1.63	163.50	39.96	203.46	19.6
Wuhu	1.13	2.01	121.00	29.38	150.38	19.5
Chekiang						
Chinhai	1.35	1.50	50.50	14.30	64.80	22.1
Fukien						
Lienkiang	0.89	1.01	128.00	54.35	182.35	29.8
Kiangsu						
Kiangning (S) ..	1.70	3.36	205.75	46.29	252.04	18.4
Kiangning (T) ..	3.73	5.80	104.99	21.53	126.52	17.0
Wuchin	0.81	1.46	276.25	144.24	420.49	34.3
Total	...	...	*1266.99*	*400.56*	*1667.55*	...
Average by localities	*1.54*	*2.32*	...	...	...	*22.5*
Total by 17 localities ..	...	...	*3128.07*	*1408.76*	*4536.83*	...
Average by 17 localities	*2.00*	*2.92*	...	...	...	*22.1*

27. *A farm woman of Fukien province carrying night-soil.*

28. *In contrast to the gleaning of crop residue for fuel in North China is the burning of rice straw in the fields in the interior of Fukien province.*

29. *In much of North China human feces only is saved and sundried for fertilizer. The neatly thatched buildings are typical of much of Shantung.*

paying the cost of the repair of the bridges and roads of the community.

The division of these animal units into labor animal units and productive animal units, that is, animals which are grown primarily for their meat, eggs, or other products, shows that less than one-fourth of all the animal units are productive animal units (table 4). In East Central China this amounts to 22.5 per cent compared with 21.9 per cent in North China. In other words, a little over three-fourths of the livestock as measured by animal units is for draft purposes. The range between localities in such percentage is from 38 to 94 per cent of the total animal units raised for draft purposes.

DENSITY OF ANIMAL POPULATION

The density of animal population is an important consideration in relation to the maintenance of the fertility of the land. Computed on a basis of the number of hectares (crop area) per animal unit, there are 2.00 hectares per animal unit for the seventeen localities. In North China there are 2.40 hectares per animal unit compared with only 1.54 hectares in East Central China. A somewhat better comparison is crop hectare area per animal unit, which is 2.92 hectares or seven acres for the seventeen localities, 3.45 hectares for the North China localities, and 2.32 hectares for East Central China. The lower production per unit of farm land in North China for human food may account for the less dense animal population. The margin for existence in North China is also lower than that for East Central China, as shown in part by the low per capita income; it is possible, therefore, that a larger number of animals may be raised in East Central China without encroaching upon the food supply of the farm population. If one crop hectare for each animal unit is considered to be heavily stocked, and three crop hectares lightly stocked (1), then the farms in the seventeen localities may be considered to be lightly stocked in relation to the maintenance of the fertility of the land. Denmark has a much greater density of animal population of approximately one crop acre, or 0.4 of a crop hectare per animal unit.

FERTILITY PRODUCED ON THE FARM

There are two chief farm sources of fertility, manure produced by animals and human feces and urine, the latter commonly termed night-soil. If a production of eight tons of manure per animal unit per year and of 1000 pounds of excreta per adult-male unit is accepted, than the fertility produced by these farm animals averages for the seventeen localities 3754 kilograms per crop hectare, or 3344 pounds per crop acre (table 5). The variation is from 1581 kilograms in Yenshan Hsien, Chihli, to 8775 kilograms for Lienkiang Hsien, Fukien. The losses that occur before such manure is applied to the ground are not known. They are probably considerable because, as a rule, farm manure is not kept under cover. In North China, especially, the manure is piled and usually turned several times. Heating to the extent of allowing nitrogen to escape often occurs, but on the other hand such treatment may prevent

TABLE 5. AMOUNT OF FERTILITY PRODUCED ON THE FARM AND VALUE OF PURCHASED FERTILIZER

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Animal manure and night-soil per crop hectare (in kilograms)	Value of fertilizer purchased per crop hectare	Provinces and hsiens in which studies were made	Animal manure and night-soil per crop hectare (in kilograms)	Value of fertilizer purchased per crop hectare
North China			*East Central China*		
Anhwei			**Anhwei**		
Hwaiyuan	2057	$0.25	Laian (1921)	4521	$1.99
Su	2295	0.51	Laian (1922)	5070	1.09
Chihli			Wuhu	4248	0.15
Pingsiang	3676	3.36	**Chekiang**		
Yenshan (1922)	1858	3.59	Chinhai	6013	8.94
Yenshan (1923)	1581	...	**Fukien**		
Honan			Lienkiang	8775	3.97
Sincheng	2493	...	**Kiangsu**		
Kaifeng	3105	1.03	Kiangning (S)	2630	...
Shansi			Kiangning (T)	1899	1.31
Wusiang	4034	...	Wuchin	5815	8.21
Wutai	...*	0.16			
Average by localities	*2637*	*1.48*	*Average by localities*	*4871*	*3.67*
			Average by 17 localities	*3754*	*2.66*

*Wutai Hsien is omitted because of incomplete population returns.

30. *Cornstalks, including the roots, being taken to market to be sold as fuel.*

the hatching of eggs of certain injurious insects. In East Central China most of the night-soil reaches the land without undue loss since the feces and the urine are both conserved. In North China the common practice is to use the feces only.

Other fertility produced on the farm and returned to the land, but for which no data were obtained, are ashes in both North and East Central China and pond or canal mud in East Central China.

PURCHASED FERTILITY

Purchased fertility averages $2.66 per hectare, or only $0.57 Gold per acre for all localities, including the four localities not buying fertilizer (table 5). The highest amount expended for fertilizer is $8.21 per hectare in Wuchin Hsien, Kiangsu. Such purchased fertilizers are chiefly oil cakes, of which bean cake constitutes by far the largest proportion.

SIGNIFICANCE OF THE FERTILITY PROBLEM

Since the farms are lightly stocked and oil cakes are good feed for animals and it is estimated that about 80 per cent of the original fertilizing value of the cakes is recovered in the manure produced by the animals, one naturally raises the question of whether or not it might be more profitable to first feed the oil cakes. From a national standpoint of economy, domestic use of the large quantities of bean cake now exported, especially from Manchuria, would probably prove profitable. Of course, an animal cannot live on oil cakes alone. But if China's other great loss of fertility and organic matter, crop stalks and residue, were used to feed cattle rather than to burn as fuel then there would be feed enough for more animals. At present, it is a common practice in parts of North China for gleaners or farmers themselves to pull crop stubble for fuel, or in more limited areas even to harvest the wheat crop by pulling. Thus only the fertility in the ash is restored to the soil. Dry weather in North China makes the extended use of organic matter difficult but apparently more is needed and, if used, might even put the soil into a better condition for conserving what little moisture is available. An adjustment of this nature would require a different fuel source. The use of coal and the forestation of the hills and mountains could certainly make

possible a more extended use of crop stalks for animal feed. On the other hand, forestation should aid in prevention of erosion and of the filling of stream channels, which results in flooding farm lands and often even in impeding navigation.

In general, the soil is insufficiently fertilized for high yields and more fertilizers could probably be used to advantage, but absence of adequate transportation and of farm credit facilities are important obstacles to the increased use of fertilizers.

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CHAPTER VIII

FARM LABOR

Man labor and animal labor, muscles of man and beast, are the sole sources of farm power on the 2866 farms of this study. Water, wind, and mechanical power, although found in limited areas of China, are chiefly for irrigation, and are not used in the localities studied. The amount of work performed per unit of land by men or animals and the proportions of each are essential to an understanding of Chinese agriculture; not only the amount of labor, moreover, but its cost and distribution throughout the year are important considerations if any appraisal or comparison with other countries is to be made.

The amount of man or animal labor is measured by units of man-work or animal-work; these are, respectively, the quantity of productive work accomplished by the average farmer or the average animal in a ten-hour day. Productive work means the work performed on crops or on animals other than labor animals. Time spent in marketing is not included because much of the marketing is done when there is no other work or else as a pastime. In this study information was collected on the kind of work done, the time of the month (first or second half) in which it was done, and the length of time required to do it. This information was obtained in each locality from a minimum of ten to twenty farms growing the important crops and from a minimum of five to ten farms growing minor crops. In a few intances the number of farms was greater than twenty and less than five. Since the amount of time needed to collect and summarize these data was very considerable, the number was necessarily limited.

LABOR REQUIREMENTS PER HECTARE

Man Labor

Man labor on grain crops is greatest for rice, amounting to 117 man-work units per hectare for ordinary rice, 122 for glutinous rice, although it is 115, nearly as high, for rapeseed (table 1).

TABLE 1. MAN-LABOR REQUIREMENTS (IN MAN-WORK UNITS) PER CROP HECTARE FOR GROWING VARIOUS CROPS

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	GRAIN CROPS														Root crops	Fiber crops	Cotton
	Wheat	Rice	Glutinous rice	Barley	Field peas	Corn	Sesame	Yellow soy beans	Green beans (Phaseolus aureus	Kaoliang	Millet	Black beans	Rapeseed	Corn and yellow soybeans	Sweet potatoes	Hemp	
North China																	
Anhwei																	
Hwaiyuan	13.77	41.31	...	21.28	...	...	55.08	71.36	35.05	57.59	130.20	...	...	...	103.91	214.07	254.13
Su	21.52	...	...	21.52	32.91	...	62.03	17.72	18.99	88.54	50.63	18.99	...	...	213.92	120.25	126.58
Chihli																	
Pingsiang	81.33	...	...	81.33	...	...	...	44.20	...	37.13	44.20	...	...	...	...	146.75	...
Yenshan (1922)	21.06	...	...	...	...	68.12	...	40.87	...	80.51	65.64	...	...	66.88	105.28	...	...
Yenshan (1923)	21.06	...	...	...	...	68.12	...	40.87	40.87	80.51	65.64	40.87	...	66.88	...	...	...
Honan																	
Sincheng	30.11	...	...	40.15	...	77.43	71.69	32.98	40.15	70.26	63.09	32.98	...	...	64.53	...	...
Kaifeng	63.75	...	...	55.13	...	29.29	37.90	24.12	10.34	22.40	27.57	...	...	18.95	32.74	130.94	94.76
Shansi																	
Wusiang	46.09	...	...	46.09	...	...	...	...	...	...	82.96	...	...	...	...	167.46	...
Wutai	66.05	...	...	...	66.05	...	...	85.39	...	77.33	85.39	...	...	...	...	69.28	...
Average by localities.	*40.53*	*41.31*	...	*44.25*	*49.48*	*60.74*	*56.68*	*44.69*	*29.08*	*63.66*	*68.37*	*30.95*	...	*50.90*	*104.08*	*141.46*	*158.49*
East Central China																	
Anhwei																	
Laian (1921)	105.11	79.74	65.24	52.56	...	...	...	...	...	...	...	...	...	...	...	...	108.73
Laian (1922)	88.80	110.55	110.55	88.80	88.80	90.61	90.61	90.61	65.24	...	...	...	65.24	...	65.24	65.24	173.98
Wuhu	...	93.40	...	...	...	...	...	...	...	...	...	...	90.44	...	...	...	...
Chekiang																	
Chinhai	98.95	170.76	169.17	...	...	...	...	121.29	...	...	...	...	105.33	...	173.95	...	207.47
Fukien																	
Lienkiang	140.09	233.48	...	...	...	...	...	...	...	140.09	140.09	...	163.44	...	163.44	186.78	...
Kiangsu																	
Kiangning (T)	82.01	145.97	229.62	80.37	...	63.97	90.21	79.17	83.20	...	...	...	...	...	106.01	...	63.07
Kiangning (S)	34.89	89.91	53.68	50.99	...	...	72.46	78.73	63.97	...	...	...	...	109.89	168.94	...	267.34
Wuchin	44.53	84.89	101.59	59.84	...	...	69.58	65.40	...	...	...	...	150.29	...	104.37	...	...
Average by localities.	*84.91*	*126.09*	*121.64*	*66.51*	*88.80*	*77.29*	*80.72*	*87.04*	*70.80*	*140.09*	*140.09*	...	*114.95*	*109.89*	*130.33*	*126.01*	*164.12*
Average by 17 localities	*59.95*	*116.67*	*121.64*	*54.37*	*62.59*	*66.26*	*68.70*	*60.98*	*44.73*	*72.15*	*75.54*	*30.95*	*114.95*	*65.65*	*118.39*	*137.60*	*162.01*

TABLE 1.—*(Continued)*

HWAIYUAN:	Vegetables 843.77, indigo 395.59, hay 36.30, wheat and field peas 28.79, peanut 227.84, sesame and small beans 62.50, sesame and yellow soybeans 63.85, watermelon 433.15, carrot 364.30, tobacco 1564.85.
SU:	Rice 17.72, buckwheat 26.58, hulless barley 26.58, red beans 17.72, broad beans 91.14, small beans 18.99, long red beans 49.37, vegetables 960.76, peanuts 173.42, carrots 75.95, red turnips 86.08, proso millet 44.30, corn 68.35, onions 198.73, watermelon 567.09, sugar cane 1389.87, tobacco 286.08, squash 115.19, hay 41.77, field peas and wheat 24.05, barley and field peas 25.32, melons and cotton 396.20, melons and tobacco 659.49, squash and corn 268.35, melons and squash 355.69.
PINGSIANG:	Indigo 434.94, sesame 44.20, kaoliang and black beans 40.66, vegetables 217.47.
YENSHAN (1922):	Yellow soybeans and millet 65.64, yellow soybeans and green beans 40.87, corn and green beans 66.88, vegetables 222.94.
YENSHAN (1923):	Proso millet 65.64, jute 79.27, vegetables 222.94, alfalfa, 84.22, tsing beans 40.87, tobacco 123.85, millet and green beans 65.64, yellow soybeans and millet 65.64, corn and green beans 66.88, corn and soybeans (green) 66.88, millet and black beans 65.64, millet and soybeans (green) 65.64, carrots 309.64.
SINCHENG:	Buckwheat 40.15, seed melons 71.70, sesame and green beans 40.15, millet and green beans 48.61, field peas 40.15, musk melon 71.70, peanuts 43.02.
KAIFENG:	Field peas 65.47, proso millet 36.18, watermelons 31.01, musk melons, 55.13, sesame and green beans 22.40.
WUSIANG:	Kaoliang and yellow soybean 86.03, yellow soybeans and rape 96.79, squash and potatoes 167.46, Irish potatoes 90.64, buckwheat 82.96, watermelons 417.88, corn and yellow soybeans 86.03.
WUTAI:	Oats 69.28, Irish potatoes 83.78, proso millet 85.39, barley 66.05.
LAIAN (1922):	Vegetables 523.74, watermelons 173.97.
CHINHAI:	Broad beans 108.52, astragalus sinensis 57.45, egg plant 164.38, cabbage 368.66, sorghum 98.95, cowpeas 108.52, mustard 300.03, taro 280.88, wild rice 140.44, sweet corn 108.52, onions 378.23, little cabbage 280.88.
LIENKIANG:	Vegetables 233.49, taro 186.78.
KIANGNING (S):	Vegetables 802.47, red and green beans 76.49, rye 48.31, field peas 48.31, red beans 85.88, field peas and wheat 50.99, barley, hulless 50.99, watermelons 319.38.
KIANGNING (T):	Broad beans 73.81, field peas 54.12, taro 851.23, turnip 341.15, vegetables 3716.58, musk melons and cowpeas 1038.21, watermelons and cowpeas 1052.97, sesame and green beans 111.53, sesame and yellow soybeans 91.85.
WUCHIN:	Broad beans 89.06, field peas 48.71, green manure 37.57, watermelons and yellow soybeans 137.77, sesame and red beans 162.82, wheat and field peas 44.53, arrowhead 90.45, taro 168.38, vegetables 198.99.

The amount of labor on other grains and on crops grown for their seed products does not differ greatly from that on wheat, which requires an average of 60 man-work units per hectare, or the equivalent of twenty-four ten-hour days per acre. In East Central China, however, wheat requires twice as many labor units as in North China, because the soil of the seed beds is stiff clay, more or less "puddled" from the growing of rice, and because fertilizer and harvested crops are carried on men's shoulders rather than in carts and wagons as in the North China plains. In North China the soil is better and more deeply prepared for kaoliang and millet than for any other crop. For this reason and also because these crops are more frequently cultivated than wheat, the number of man-work units is higher than for wheat, 64 and 68 respectively as compared with 41 for wheat. Sweet potatoes, a root crop, require 118 man-work

units per hectare, more than any grain crop except glutinous rice. Hemp averages 138 units, and cotton the most of all the important crops, 162 man-work units. Crops requiring large amounts of labor are vegetables, squash, tobacco, indigo, and melons, varying from 200 to 1000 man-work units per hectare. These crops enlarge the farm business and make possible more productive labor on a small amount of land.

There is, of course, considerable variation between localities in the number of man-work units required per hectare because of the different farm practices, and because of difference in soils, topography, and climatic conditions. More animal labor is used in North China than in East Central China, and for this reason proportionately less man labor is required for a given crop.

Man labor requirements per acre in the United States are much lower than in China, as is illustrated in fig. 1. This smaller amount of labor is made possible by the use of farm machinery and improved tools and by the driving of more animals by one

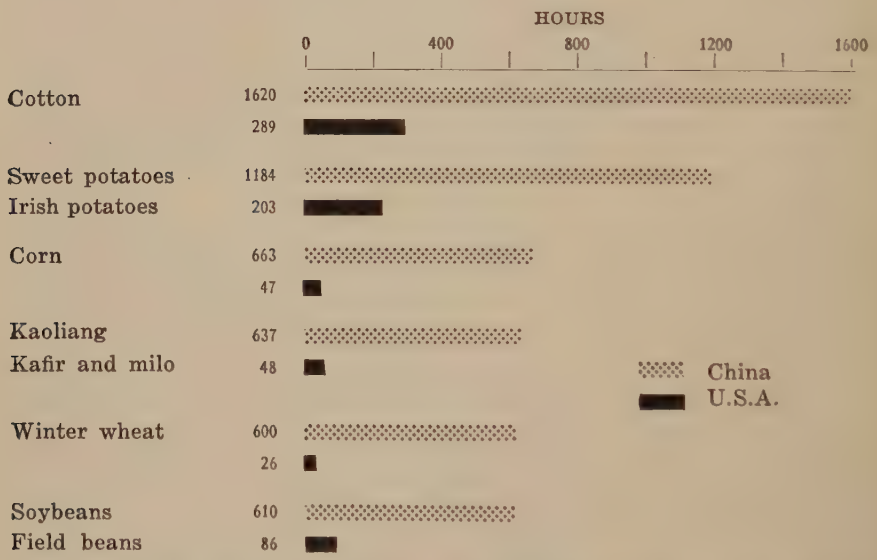

Fig. 1.—Hours of man labor per hectare required to grow various crops in China and in the United States*

*Data for China are from 2866 farms in seventeen localities and seven provinces (1921-1925). Data for the United States are from a number of different states as given in the Department of Agriculture Yearbook, 1921.

man and by the use of larger and more rapidly moving animals, such as the horse.

Animal Labor

Labor requirements per hectare for labor animals are much less than for man labor but, like man labor requirements, animal labor requirements for rice are higher than for any other grains and are only one animal-work unit less for rapeseed (table 2). For rice the number of units is 31 and for wheat 20. Wheat has only six units less in East Central China than the average in North China. Soybeans are a crop requiring a small amount of animal labor in North China, only 12 animal-work units, because they are usually drilled after wheat without previous plowing or harrowing.

A comparison of animal labor requirements in China and the United States is shown in fig. 2. The difference may be expressed in the number of labor animal units per man-equivalent, 0.48 for China and 3.82 for the United States.

LABOR REQUIREMENTS PER FARM

Man Labor

Amount of man labor.—Man-work units vary from 112 on farms in the smallest size-group to 519 on farms in the large size-group, (table 9, chapter III). The median (table 8, chapter III) shows an average per farm of 190 man-work units, and this is performed by an average of two man-equivalents per farm (table 6, chapter III).

When one considers that out of the total number of days in the year only this small amount of productive work is done, it becomes apparent that there are the equivalent of several idle months each year for each farm operator and each family farm laborer. While there is some other work to be done, of course, and equally of course some rainy days and some holidays to be allowed for, it is nevertheless evident that these could scarcely account for only about one-fourth of the year being utilized directly upon productive enterprises.

Kind of farm labor.—Over two-fifths of the farm labor is performed by members of the family, nearly one-fifth by hired labor and not quite two-fifths by the operator himself (table 3). The proportion is about the same in both North and in East

TABLE 2. ANIMAL LABOR REQUIREMENTS (IN ANIMAL-WORK UNITS) PER CROP HECTARE FOR GROWING VARIOUS CROPS

2764 farms, 16 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Grain crops														Root crops	Fiber crops	Cotton
	Wheat	Rice	Glutinous rice	Barley	Field peas	Corn	Sesame	Soybeans	Green beans	Kaoliang	Millet	Black beans	Rapeseed	Corn and soybeans	Sweet potatoes	Hemp	
North China																	
Anhwei																	
Hwaiyuan	11.27	16.27	...	17.53	...	...	10.02	13.77	10.02	16.27	28.79	...	...	...	13.77	18.78	25.04
Su	17.72	...	...	17.72	20.25	...	11.39	3.80	3.80	31.65	32.91	3.80	...	...	13.92	27.85	17.72
Chihli																	
Pingsiang	21.22	...	...	21.22	...	...	...	12.38	...	10.61	17.68	...	...	...	...	14.14	...
Yenshan (1922)	12.39	...	...	...	...	16.10	...	7.43	...	23.53	23.53	...	...	12.39	16.10	...	...
Yenshan (1923)	12.39	...	...	...	...	16.10	...	7.43	7.43	23.53	23.53	7.43	...	12.39	...	...	...
Honan																	
Sincheng	24.38	...	...	37.28	...	25.81	45.88	7.17	5.74	43.02	24.38	7.17	...	...	34.41	...	...
Kaifeng	65.47	...	...	55.13	...	13.78	20.68	17.23	6.89	18.95	24.12	...	...	10.34	15.51	91.32	41.35
Shansi																	
Wusiang	16.90	...	...	16.90	...	...	...	...	...	...	24.88	...	...	...	...	47.63	...
Wutai	22.56	...	...	...	22.56	...	...	29.00	...	27.39	29.00	...	...	...	...	14.50	...
Average by localities.	*22.70*	*16.27*	...	*27.63*	*21.41*	*17.95*	*21.99*	*12.28*	*6.78*	*24.37*	*25.42*	*6.13*	...	*11.71*	*18.74*	*35.70*	*28.04*
East Central China																	
Anhwei																	
Laian (1921)	14.50	27.18	23.56	12.69	...	...	...	...	...	...	...	...	...	...	...	...	12.69
Laian (1922)	23.56	27.18	27.18	23.56	23.56	23.56	23.56	23.56	21.75	...	...	...	21.75	...	21.75	21.75	47.12
Chekiang																	
Chinhai	35.11	86.18	86.18	...	...	...	...	44.69	...	...	...	...	36.71	...	44.69	...	46.28
Fukien																	
Lienkiang	28.02	49.03	...	...	...	...	...	...	...	18.68	18.68	...	...	...	28.02	28.02	...
Kiangsu																	
Kiangning (S)	5.37	12.03	6.71	4.03	...	...	6.71	5.37	5.37	...	...	...	...	...	6.71	...	5.37
Kiangning (T)	4.92	4.92	13.12	4.92	...	4.92	4.92	4.92	4.92	...	...	...	...	6.56	6.56	...	6.56
Wuchin	5.57	22.27	6.96	8.35	...	...	...	...	...	...	...	...	...	...	16.70	...	...
Average by localities.	*16.72*	*32.68*	*27.29*	*10.71*	*23.56*	*14.24*	*11.73*	*19.64*	*10.68*	*18.68*	*18.68*	...	*29.23*	*6.56*	*20.73*	*24.88*	*23.60*
Average by 16 localities	*20.08*	*30.63*	*27.29*	*19.94*	*22.12*	*16.71*	*17.59*	*14.73*	*8.24*	*23.74*	*24.75*	*6.13*	*29.23*	*10.42*	*19.83*	*33.00*	*25.27*

TABLE 2.—*(Continued)*

HWAIYUAN:	Indigo 20.03, hay 13.77, wheat and field peas 27.54, peanuts 45.07, sesame and small beans 13.77, sesame and yellow soybeans 15.02, watermelons 21.28, carrots 12.52, muskmelon 41.31.
SU:	Rice 3.80, buckwheat 16.46, naked barley 16.46, red beans 3.80, broad beans 16.46, small beans 5.06, long, red beans 11.39, peanuts 29.11, carrots 13.92, red turnips 17.72, proso millet 32.91, corn 10.13, onions 13.92, watermelons 17.72, tobacco 6.33, squash 7.59, hay 12.66, wheat and field peas 15.19, barley and field peas 18.99, melons and cotton 15.19, melons and squash 8.86.
PINGSIANG:	Vegetables 12.38, indigo 24.75, sesame 12.38, kaoliang and black beans 12.38.
YENSHAN (1922):	Yellow soybeans and millet 12.39, yellow soybeans and green beans 7.43, corn and green beans 12.39.
YENSHAN (1923):	Proso millet 23.53, jute 3.72, alfalfa 12.39, tsing beans 7.43, millet and green beans 12.39, yellow soybeans and millet 12.39, corn and green beans 12.39, corn and tsing beans 12.39, millet and black beans 12.39, millet and tsing beans 12.39, carrot 7.43.
SINCHENG:	Buckwheat 34.41, seed melons 30.11, sesame and green beans 4.30, millet and green beans 7.17, field peas 37.28, muskmelon 30.11, peanuts 22.94.
KAIFENG:	Field peas 51.69, proso millet 18.95, watermelons 10.34, muskmelons 25.85, sesame and green beans 15.51.
WUSIANG:	Kaoliang and soybeans 26.12, yellow soybeans and rape 13.83, squash and potatoes 47.63, Irish potatoes 33.80, buckwheat 24.58, watermelons 118.30, corn and soybeans 26.12.
WUTAI:	Oats 14.50, proso millet 29.00, barley 22.56, Irish potatoes 37.05.
LAIAN (1922):	Watermelons 47.12.
CHINHAI:	Broad beans 44.69, clover 15.96, red flower 15.96, eggplant 44.69, cabbage 35.11, sorghum 44.69, cowpea 44.69, mustard 35.11, taro 79.80, wild rice 15.96, sweet corn 44.69, onions 44.69, little cabbage 17.56.
LIENKIANG:	Red beans and green beans 9.34, rye 9.34, field peas 9.34, red beans 9.34, field peas and wheat 7.00, barley, hulless 7.00, watermelons 35.02.
KIANGNING (T):	Broad beans 4.92, field peas 4.92, turnips 6.56, muskmelons and cowpeas 6.56, watermelons and cowpeas 6.56, sesame and green beans 6.56, sesame and yellow soybeans 4.92.
WUCHIN:	Broad beans 9.74, rape 9.74, field peas 9.74, wheat and field peas 6.96.

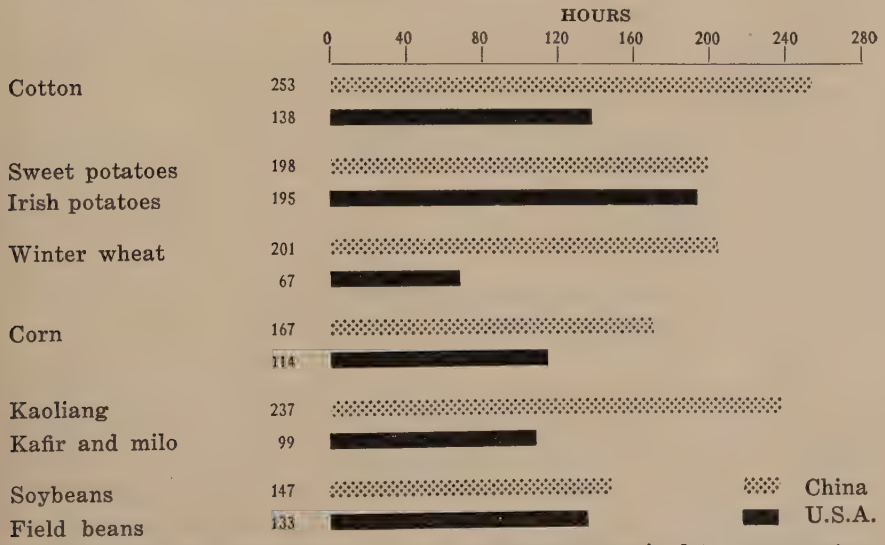

Fig. 2.—Hours of animal labor per hectare required to grow various crops in China and in the United States*

*Data for China are from 2866 farms in seventeen localities and seven provinces (1921-1925). Data for the United States are from a number of different states as given in the Department of Agriculture Year-book, 1921.

TABLE 3. PERCENTAGE OF FAMILY, HIRED AND OPERATOR'S LABOR COST TO TOTAL LABOR COST*

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Family labor	Hired labor	Operator's labor
North China			
Anhwei			
Hwaiyuan	52.2	21.3	26.5
Su	43.5	25.3	31.2
Chihli			
Pingsiang	31.0	14.3	54.7
Yenshan (1922)	42.9	7.0	50.1
Yenshan (1923)	38.9	14.6	46.5
Honan			
Sincheng	72.9	6.9	20.2
Kaifeng	40.9	27.7	31.4
Shansi			
Wusiang	4.7	27.0	68.3
Wutai	37.0	26.5	36.5
Average by localities	*40.4*	*19.0*	*40.6*
East Central China			
Anhwei			
Laian (1921)	71.0	18.0	11.0
Laian (1922)	66.2	9.0	24.8
Wuhu	51.5	15.5	33.0
Chekiang			
Chinhai	11.5	31.8	56.7
Fukien			
Lienkiang	47.9	4.7	47.4
Kiangsu			
Kiangning (S)	24.9	34.1	41.0
Kiangning (T)	60.3	11.0	28.7
Wuchin	24.3	36.9	38.8
Average by localities	*44.7*	*20.1*	*35.2*
Average by 17 localities	*42.4*	*19.5*	*38.0*

*The value of family and operator's labor cost is estimated as equivalent to wages paid hired labor.

Central China. Of the hired labor and the family labor (exclusive of the operator) approximately two-thirds is performed by members of the family and the remaining one-third is hired either as year or day labor (table 4). The proportion is nearly the same in both East Central and North China. Labor hired by the year constitutes nearly one-fourth of all hired and family labor and is a slightly higher proportion

TABLE 4. PROPORTION (BY COST) OF FARM LABOR PERFORMED BY THE FAMILY (MEN, WOMEN AND CHILDREN, OTHER THAN THE OPERATOR) AS COMPARED WITH HIRED LABOR

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Kind of labor (percentage)						Total (percentage)	
	Family labor			Hired labor				
	Men	Women	Boys	Year	Day	Boys	Family labor	Hired labor
North China								
Anhwei								
Hwaiyuan	22.2	34.2	14.5	24.8	0.9	3.4	70.9	29.1
Su	51.9	11.6	...	25.0	11.5	...	63.5	36.5
Chihli								
Pingsiang	46.7	1.9	20.0	22.8	8.6	...	68.6	31.4
Yenshan (1922)	73.0	1.6	11.1	4.8	9.5	...	85.7	14.3
Yenshan (1923)	56.4	7.7	7.7	17.9	10.3	...	71.8	28.2
Honan								
Sincheng	37.7	46.2	7.6	4.7	3.8	...	91.5	8.5
Kaifeng	53.2	1.3	5.2	24.7	15.6	...	59.7	40.3
Shansi								
Wusiang	11.7	1.3	1.3	81.8	3.9	...	14.3	85.7
Wutai	56.1	...	3.0	30.3	10.6	...	59.1	40.9
Average by localities	*45.4*	*11.8*	*7.8*	*26.3*	*8.3*	*0.4*	*65.0*	*35.0*
East Central China								
Anhwei								
Laian (1921)	36.1	42.5	1.3	10.5	9.6	...	79.9	20.1
Laian (1922)	37.1	49.2	1.7	8.0	4.0	...	88.0	12.0
Wuhu	39.8	36.1	0.9	22.6	0.6	...	76.8	23.2
Chekiang								
Chinhai	1.0	25.3	0.3	57.2	16.2	...	26.6	73.4
Fukien								
Lienkiang	34.9	52.7	3.6	2.3	6.5	...	91.2	8.8
Kiangsu								
Kiangning (S)	41.6	...	0.7	42.4	15.3	...	42.3	57.7
Kiangning (T)	25.7	46.2	12.7	3.3	11.5	0.6	84.6	15.4
Wuchin	32.3	1.0	6.3	27.1	31.2	2.1	39.6	60.4
Average by localities	*31.1*	*31.6*	*3.4*	*21.7*	*11.9*	*0.3*	*66.1*	*33.9*
Average by 17 localities	*38.7*	*21.1*	*5.7*	*24.1*	*10.0*	*0.4*	*65.5*	*34.5*

in North than in East Central China. There are in all 663 farm laborers (including three female laborers) hired by the year, or one such laborer to every four and one-third farms.

A little over one-fifth of all hired and family labor on the farm is performed by farm women. In East Central China it is 31.6 per cent compared with 11.8 per cent in North China. This real difference is probably because foot binding is much more prevalent in North China.

Boys do 6.1 per cent of the hired and family labor, and 0.4 per cent is hired boy labor. Child labor on the farm cannot, of course, be thought of in the same terms as in the factory, because often the children are better off at work than otherwise. The chief problem in connection with child labor on farms in

China at the present time is in relation to education, because most farmers object to sending their children to school partly because of the need for them on the farm.

Amount of hired labor by size-groups of farms.—The extent to which labor is hired on different sizes of farms is shown by the percentage of family and hired labor that is hired on farms in the different size-groups (table 5). It is seen that only 4.3

TABLE 5. PERCENTAGE OF HIRED LABOR COST BY SIZE OF FARM TO TOTAL LABOR COST†

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Small	Medium small	Medium	Medium large	Large	All farms
North China						
Anhwei						
Hwaiyuan	0.3	8.7	12.4	28.1	39.4	21.3
Su	8.7	...	19.1	...	34.3	25.3
Chihli						
Pingsiang	2.4	...	8.3	...	23.5	14.3
Yenshan (1922)	7.1	4.9	...	3.4	10.2	7.0
Yenshan (1923)	2.8	...	8.6	...	23.0	14.6
Honan						
Sincheng	1.5	5.3	...	7.8	12.8	6.9
Kaifeng	2.2	6.2	...	17.6	48.1	27.7
Shansi						
Wusiang	3.8	5.5	14.9	24.4	57.5	27.0
Wutai	8.1	14.9	32.5	37.9	37.2	26.5
Average by localities.	*4.1*	...	*13.0**	...	*31.8*	*19.0*
East Central China						
Anhwei						
Laian (1921)	3.1	8.2	...	14.6	31.2	18.0
Laian (1922)	0.9	...	9.9	...	13.0	9.0
Wuhu	6.9	4.2	...	25.0	23.5	15.5
Chekiang						
Chinhai	7.3	...	18.7	...	52.9	31.8
Fukien						
Lienkiang	0.7	...	5.5	...	6.1	4.7
Kiangsu						
Kiangning (S)	8.0	12.8	...	27.6	49.4	34.1
Kiangning (T)	5.8	5.8	8.3	12.0	16.8	11.0
Wuchin	3.6	16.4	43.6	59.6	58.5	36.9
Average by localities.	*4.5*	...	*15.7**	...	*31.4*	*20.1*
Average by 17 localities	*4.3*	...	*14.3**	...	*31.6*	*19.5*

*In obtaining this average, those places having farms in the medium small, medium and medium large groups are all classified under medium.

†Including the value of family and operator's labor.

31. *A farm woman harvesting barley less than half a mile from Nanking. The sickle is the chief harvester throughout China.*

32. *Sharpening the sickle—a scene in every harvest. Since the farm woman must help in the harvesting, the children are also a part of the picture.*

33. *Threshing wheat with flails near Nanking. In North China threshing is done chiefly with a stone roller pulled by animals.*

per cent is hired on farms in the small size-group compared with 14.3 per cent in the medium and 31.6 per cent in the large size-group. It is quite evident, therefore, that with the increase in the size of the farm it is necessary to increase the amount of hired labor. This, however, does not alter the fact that farms in the largest size-group are in most instances the most profitable.

Animal Labor

Amount of animal labor.—The amount of animal power used per farm for the different localities studied is very small and amounts to only 90 animal-work units per farm for farms having labor animals (table 11, chapter III), or 75 such units for all farms including those without animals. In other words, while a man works on the average the equivalent of 119 ten-hour days during the year on productive enterprises (table 18, chapter IV) a labor animal only works the equivalent of 63 ten-hour days (table 21, chapter IV). Still the animal must be fed and given care. A common sight is to see animals lying under the shade of a tree on a hot summer's day, while human beings are toiling with a hoe in the broiling sun. Without question, a cultivator drawn by animals would save labor, but it would mean the widening of the rows of various crops and thus the yield might be adversely affected. This is a management problem which needs careful consideration.

Kinds of animal labor.—By far the greater proportion of all animal labor, nearly 38 per cent, is from oxen as compared with about 20 per cent from water buffaloes, about 13 per cent from donkeys, 4.6 per cent from mules, and 3.2 per cent from horses (table 2, chapter VII). In North China over one-fifth of the animal labor is from donkeys, an animal sufficiently inexpensive to be afforded by a poor farmer and suitable in size for the second or third animal of a team. A donkey on the farm is also convenient for milling purposes and as a pack animal.

SEMI-MONTHLY DISTRIBUTION OF MAN LABOR

The semi-monthly distribution of man labor for all crops is in most places so uneven as to result in periods of either too little or too much work. Distribution of labor for important and minor crops is shown for nine typical localities in tables 6-14

TABLE 6. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

124 farms, Hwaiyuan Hsien, Anhwei, China

Months	First or second half	Rice	Kaoliang	Wheat	Sweet potatoes	Cotton	Sesame	Soybeans	Vegetables	Barley	Wheat and field peas	Green beans	Millet	Indigo	Hemp	Muskmelons	Peanuts	Sesame and small beans	Sesame and soybeans	Tobacco	Watermelons	Carrots	Other crops	Total hours
January	1st	529	...	...	...	46	...	...	28	...	...	...	...	...	40	...	8	...	...	...	...	12	9	672
	2nd	529	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	36	...	565
February	1st	1095	...	...	241	...	...	...	...	...	...	...	...	...	22	...	...	...	...	...	...	...	...	1358
	2nd	441	...	...	...	173	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	615
March	1st	2393	...	383	11	52	...	...	...	...	...	...	...	...	...	13	...	...	...	9	2	...	...	2863
	2nd	132	2584	1696	587	187	...	...	...	65	128	...	...	10	35	...	13	...	...	65	7	...	...	5509
April	1st	3779	...	438	152	403	...	...	...	1110	889	...	...	38	84	84	...	...	...	74	12	...	...	7063
	2nd	713	3709	5290	758	418	...	...	...	...	...	...	257	172	121	111	368	...	...	5	12	...	3	11937
May	1st	2308	11668	...	1199	2958	...	...	...	...	...	...	192	437	855	554	194	...	...	91	28	...	2	20486
	2nd	4248	9399	2828	639	2222	309	...	...	3771	...	...	770	594	639	97	194	20	63	148	59	...	9	26009
June	1st	1449	...	5339	3616	709	1708	1248	...	...	2901	...	665	213	236	560	153	255	243	32	50	...	8	19385
	2nd	30481	8913	810	4147	294	9517	1656	...	...	171	58	385	454	318	491	...	672	256	37	40	...	6	58706
July	1st	2514	6672	372	1890	...	5724	5664	...	...	...	363	...	524	526	82	...	...	128	67	29	18	7	24580
	2nd	6005	...	...	3545	...	2504	2640	1456	...	...	247	...	393	570	...	...	259	180	146	85	6	462	18498
August	1st	3462	8230	...	2418	6748	268	770	964	72	156	1058	1770	866	...	195	...	...	...	86	11	64	344	27483
	2nd	162	...	...	2827	7396	...	...	1390	144	469	1738	...	80	301	...	...	...	...	...	...	75	469	15051
September	1st	8012	458	...	885	4565	2632	...	559	522	142	529	...	...	...	...	...	179	...	...	...	34	185	18702
	2nd	1793	...	4570	556	...	239	1912	1008	359	498	...	...	...	...	...	...	...	295	109	...	6	316	11661
October	1st	6277	...	5932	1489	...	...	...	1527	777	910	892	...	...	...	...	...	...	...	...	...	...	496	18300
	2nd	...	2593	2325	3367	...	...	...	1131	1087	341	708	...	...	...	...	673	...	...	...	...	...	369	12594
November	1st	...	...	...	...	...	...	...	1301	282	...	...	...	...	...	...	...	...	...	...	...	...	409	1992
	2nd	470	...	...	...	...	...	...	1845	...	...	...	...	...	...	...	...	...	...	...	1	...	579	2895
December	1st	...	...	...	...	23	...	...	1626	...	...	...	33	...	...	2	...	...	...	6	...	...	511	2201
	2nd	...	...	...	...	150	...	...	28	...	...	...	107	13	...	4	...	...	...	...	1	5	10	318
Total		*76792*	*54226*	*29983*	*28327*	*26344*	*22901*	*13890*	*12863*	*8139*	*6605*	*5593*	*4179*	*3794*	*3747*	*2193*	*1603*	*1385*	*1165*	*875*	*338*	*256*	*4194*	*309442*
Percentage		*24.8*	*17.5*	*9.7*	*9.2*	*8.5*	*7.4*	*4.5*	*4.2*	*2.7*	*2.1*	*1.8*	*1.3*	*1.2*	*1.2*	*0.7*	*0.5*	*0.4*	*0.4*	*0.3*	*0.1*	*0.1*	*1.4*	*100.0*

TABLE 7. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

286 farms, Su Hsien, Anhwei, China (1924)

Months	First or second half	Kaoliang	Wheat	Soybeans	Wheat and field peas	Barley	Field peas	Sesame	Cotton	Green beans	Millet	Vegetables	Hemp	Other crops	Total hours
February	1st	5188	...	...	...	...	...	252	394	...	502	336	71	504	7247
	2nd	1933	...	...	...	...	...	315	590	...	896	...	33	241	4008
March	1st	4577	...	...	...	...	...	126	39	...	746	48	218	162	5916
	2nd	3948	...	...	...	...	...	638	...	...	464	...	218	277	5545
April	1st	4978	9430	...	4327	3957	4096	71	111	...	...	1512	186	7104	35772
	2nd	24947	5395	...	3060	2672	1940	248	709	...	585	1512	828	29639	71535
May	1st	23981	...	...	...	...	...	1135	...	...	1089	750	1081	3535	31571
	2nd	18462	6084	1603	...	...	...	1891	3336	...	1971	300	481	16554	50682
June	1st	...	27040	4828	28023	24942	23476	1458	...	156	448	600	...	7745	118716
	2nd	9877	7639	5102	...	...	...	2837	1968	2132	1568	780	...	7581	38584
July	1st	509	811	17491	...	...	...	2364	1624	7696	...	480	2171	21165	54311
	2nd	36492	406	3644	...	445	...	3420	1427	156	1613	1155	4862	10800	64420
August	1st	42722	6828	...	...	223	...	4019	4428	6916	851	1110	...	9874	76971
	2nd	...	11492	...	...	891	...	6698	3542	11128	...	330	...	6264	40345
September	1st	...	11830	18584	1524	2517	...	7092	7085	1040	...	1560	...	992	52224
	2nd	...	2484	32432	4045	6603	...	1576	197	...	...	750	...	18803	66840
October	1st	...	1744	...	6156	3953	7067	...	5314	...	...	1200	...	12452	37886
	2nd	5442	...	...	1372	445	2695	355	399	...	4193	270	112	5194	20477
November	1st	2645	...	...	...	...	...	...	315	...	341	96	104	585	4086
	2nd	102	...	...	...	...	...	...	118	...	...	288	...	309	817
December	1st	305	...	...	...	...	...	...	....	...	394	576	19	81	1375
	2nd	6002	...	...	...	...	...	567	394	...	556	...	132	64	7715
Total		*191210*	*91133*	*83684*	*48507*	*46648*	*39274*	*35062*	*31990*	*29224*	*16217*	*13653*	*10516*	*159925*	*797043*
Percentage		*24.0*	*11.4*	*10.5*	*6.1*	*5.9*	*4.9*	*4.4*	*4.0*	*3.7*	*2.0*	*1.7*	*1.3*	*20.1*	*100.0*

TABLE 8. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

152 farms, Pingsiang Hsien, Chihli, China (1923)

Months	First or second half	Wheat	Vegetables	Millet	Kaoliang	Hemp	Soybeans	Other crops	Total hours
March	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	261	261
April	1st	6065	...	...	...	...	...	3145	9210
	2nd	5251	...	1700	1844	935	83	70	9883
May	1st	1318	...	...	...	411	...	3198	4927
	2nd	4857	...	2058	1914	871	84	304	10088
June	1st	6632	...	733	...	581	...	2969	10915
	2nd	1175	1501	2245	1773	...	86	685	7465
July	1st	853	5366	1183	922	1271	...	1570	11165
	2nd	796	4195	2011	142	3165	66	1750	12125
August	1st	493	1256	2198	2625	...	...	6186	12758
	2nd	3896	2560	2965	934	...	266	264	10885
September	1st	153	3165	2030	390	...	...	1610	7348
	2nd	...	869	502	893	57	50	26	2397
October	1st	600	3195	...	...	...	...	196	3991
	2nd	4556	...	...	...	...	...	...	4556
Total		*36645*	*22107*	*17625*	*11437*	*7291*	*635*	*22234*	*117974*
Percentage		*31.1*	*18.8*	*14.9*	*9.7*	*6.2*	*0.5*	*18.8*	*100.0*

TABLE 9. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

133 farms, Yenshan Hsien, Chihli, China (1923)

Months	First or second half	Kaoliang	Wheat	Millet	Corn	Other crops	Total hours
February	1st	...	...	...	...	152	152
	2nd	333	...	738	...	218	1289
March	1st	2184	157	1499	...	460	4250
	2nd	2915	...	1873	...	346	5134
April	1st	4580	...	2129	...	390	7099
	2nd	10931	...	3997	...	630	15558
May	1st	11035	...	4702	...	690	16427
	2nd	3227	...	2715	...	420	6362
June	1st	4268	15217	1629	...	375	21489
	2nd	4789	16613	2009	2857	6494	32762
July	1st	2811	2379	2281	9719	11330	28520
	2nd	1509	786	1330	2057	8110	13792
August	1st	8640	...	1086	1875	8581	20182
	2nd	23829	2654	9524	1024	2522	39563
September	1st	18769	8139	7765	710	1398	36781
	2nd	...	5953	109	3390	1767	11219
October	1st	...	389	...	5419	14895	20703
	2nd	1072	...	...	928	10807	12807
November	1st	2800	...	1072	4063	3033	10968
	2nd	...	...	347	437	234	1018
December	1st	...	...	130	...	11	141
	2nd	...	...	...	...	...	...
Total		*103652*	*52287*	*44935*	*32479*	*72863*	*306216*
Percentage		*33.8*	*17.1*	*14.7*	*10.6*	*23.8*	*100.0*

TABLE 10. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

144 farms, Sincheng Hsien, Honan, China (1923)

Months	First or second half	Wheat	Late millet	Kaoliang	Corn	Sweet potatoes	Black soybeans	Barley	Sesame	Seed melons	Green beans	Buck wheat	Early millet	Sesame and green beans	Millet and green beans	Other crops	Total hours
March	1st	...	...	4561	...	...	...	...	...	...	...	...	...	...	...	...	4561
	2nd	...	...	2129	...	...	...	...	...	...	...	...	...	...	...	...	2129
April	1st	...	...	5372	...	...	...	...	...	1440	...	...	1183	...	...	181	8176
	2nd	...	...	1621	...	...	...	...	1410	721	...	...	...	...	...	91	3843
May	1st	...	...	...	...	3462	...	...	...	380	...	...	155	...	...	48	4045
	2nd	24479	...	14661	...	1659	...	3574	2276	...	...	...	1028	...	...	92	47769
June	1st	28037	2660	...	6035	2080	1308	5883	3951	3250	610	...	...	52	12	776	55554
	2nd	...	21988	...	3592	5896	4359	...	...	...	4387	...	2358	...	...	869	43449
July	1st	...	...	...	14547	...	...	...	...	1200	...	...	...	456	96	151	16450
	2nd	...	...	...	...	...	...	...	...	...	...	1635	...	...	...	...	1635
August	1st	...	...	19222	...	...	...	...	...	2950	...	1950	...	...	...	372	24494
	2nd	14953	...	...	...	...	...	...	1263	...	...	...	...	...	...	56	16272
September	1st	13211	24798	...	18768	...	...	4418	1354	...	1436	653	2948	...	96	50	67732
	2nd	7392	...	...	...	...	...	2175	...	...	2393	...	...	342	...	28	12330
October	1st	...	...	...	...	...	13939	1649	...	...	...	...	...	...	...	2779	18367
	2nd	...	...	...	...	...	...	...	...	...	...	3534	...	...	...	...	3534
November	1st	...	...	...	...	6372	...	...	...	...	...	...	...	...	...	...	6372
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total		*88072*	*49446*	*47566*	*42942*	*20369*	*19606*	*17699*	*10254*	*9941*	*8826*	*7772*	*7672*	*850*	*204*	*5493*	*336712*
Percentage		*26.2*	*14.7*	*14.1*	*12.8*	*6.0*	*5.8*	*5.3*	*3.0*	*2.9*	*2.6*	*2.3*	*2.3*	*0.3*	*0.1*	*1.6*	*100.0*

TABLE 11. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

226 farms, Wutai Hsien, Shansi, China (1922)

Months	First or second half	Oats	Foxtail millet	Kaoliang	Wheat	Irish potatoes	Other crops	Total hours
	1st	...	...	...	...	1327	...	1327
February	2nd	...	...	...	11298	10949	2870	25117
	1st	13780	...	15234	7344	...	2335	38693
March	2nd	1654	...	2101	7626	...	2002	13383
	1st	...	...	12082	1130	...	661	13873
April	2nd	...	16674	2101	...	...	21943	40718
	1st	64380	18115	14971	...	28701	24231	150398
May	2nd	...	1647	...	...	...	2161	3808
	1st	...	16468	51479	...	16756	23196	107899
June	2nd	...	25525	...	3389	1659	34353	64926
	1st	44647	27584	...	15252	...	40014	127497
July	2nd	18190	...	...	35306	...	8969	62465
	1st	14607	...	...	18077	37825	4592	75101
August	2nd	2480	...	...	2542	2157	646	7825
	1st	8544	48169	46226	1977	498	65131	170545
September	2nd	22048	21203	21275	...	...	28476	93002
	1st	110791	100661	78795	...	...	134509	424756
October	2nd	...	5764	...	...	...	7563	13327
Total		*301121*	*281810*	*244264*	*103941*	*99872*	*403652*	*1434660*
Percentage		*21.0*	*19.6*	*17.0*	*7.2*	*7.0*	*28.2*	*100.0*

TABLE 12. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

161 farms, Lienkiang Hsien, Fukien, China (1923)

Months	First or second half	Early and late rice	Sweet potatoes	Other crops	Total hours
January	1st	...	1164	60	1224
	2nd	...	1164	60	1224
February	1st	2776	...	381	3157
	2nd	1850	...	254	2104
March	1st	29423	...	4040	33463
	2nd	17580	...	2414	19994
April	1st	7402	1164	1076	9642
	2nd	15729	12571	2803	31103
May	1st	5551	17460	1656	24667
	2nd	19985	14550	3489	38024
June	1st	28682	7566	4326	40574
	2nd	14804	4656	2271	21731
July	1st	11103	5820	1822	18745
	2nd	6477	1164	949	8590
August	1st	...	5238	268	5506
	2nd	...	2328	119	2447
September	1st	13879	3492	2084	19455
	2nd	5551	1164	822	7537
October	1st	3701	4074	717	8492
	2nd	19430	10476	3204	33110
November	1st	5551	6402	1096	13049
	2nd	4626	3492	814	8932
December	1st	17580	...	2414	19994
	2nd	...	...	...	...
Total		*231680*	*103945*	*37139*	*372764*
Percentage		*62.1*	*27.9*	*10.0*	*100.0*

TABLE 13. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

217 farms, Kiangning (T) Hsien, Kiangsu, China (1924)

Months	First or second half	Rice	Wheat	Barley	Soybeans	Vegetables	Corn and soybeans	Field peas	Broad beans	Watermelons and cowpeas	Glutinous rice	Sweet potatoes	Corn	Sesame and green beans	Cotton	Sesame	Sesame and soybeans	Winter radish	Taro	Other crops	Total hours
January	1st	...	7757	3591	...	...	...	791	411	...	...	...	...	...	...	...	...	...	...	...	12550
	2nd	...	1293	811	...	...	...	791	257	...	...	...	...	...	5	...	...	...	...	...	3157
February	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	9
March	1st	...	12023	8572	...	...	...	1440	1003	...	...	...	...	...	...	...	...	...	...	...	23038
	2nd	...	12928	9731	...	...	...	1694	1183	43	...	18	...	55	...	24	...	...	...	79	25755
April	1st	...	2473	...	...	...	...	...	116	157	...	17	...	...	...	...	...	...	...	114	2877
	2nd	...	...	...	...	4489	...	...	...	297	...	...	...	...	81	55	...	...	...	247	5169
May	1st	...	...	...	...	5813	...	...	...	442	...	...	...	...	110	...	...	...	20	355	6740
	2nd	35335	6399	13539	...	6909	...	...	778	830	99	...	...	68	185	182	...	...	16	724	65064
June	1st	37877	48884	8044	10107	4022	2496	3363	2907	920	1453	...	189	170	153	158	62	...	13	860	121678
	2nd	49190	...	1593	9633	2784	7054	...	...	1510	1700	662	276	255	77	210	141	...	20	1344	76449
July	1st	50380	...	...	10522	2531	8617	...	...	1353	1716	524	609	224	...	153	140	...	12	1273	78054
	2nd	28310	...	...	4446	844	501	...	...	1537	1096	277	...	86	...	31	85	...	8	1299	38520
August	1st	4044	...	...	...	...	...	...	...	1210	64	231	...	...	...	...	...	...	8	976	6533
	2nd	809	...	...	...	...	...	...	...	354	13	169	...	...	41	...	...	38	...	299	1723
September	1st	32932	...	...	...	...	3382	...	...	190	39	169	...	41	104	153	...	73	2	181	37266
	2nd	16986	...	...	...	5363	...	...	...	231	194	123	501	205	139	31	59	74	8	362	24276
October	1st	231	9292	3895	9559	5250	2806	...	129	95	477	62	80	215	110	...	59	79	5	264	32608
	2nd	...	20434	5930	7003	5400	2495	1620	2078	...	12	...	...	132	120	...	99	63	...	113	45499
November	1st	...	...	...	...	4350	817	...	...	...	...	...	...	...	...	...	...	15	...	...	5182
	2nd	2218	...	695	...	3225	...	...	...	...	...	444	...	...	...	...	...	18	...	...	6600
December	1st	...	1034	463	...	...	...	847	309	...	...	...	...	...	...	...	...	16	...	...	2669
	2nd	...	5042	1853	...	...	...	1299	720	...	...	...	...	...	...	...	...	39	...	...	8953
Total		*258312*	*127559*	*58717*	*51270*	*50980*	*28163*	*11845*	*9891*	*9169*	*6863*	*2696*	*1655*	*1451*	*1134*	*997*	*654*	*415*	*112*	*8490*	*630369*
Percentage		*41.0*	*20.2*	*9.3*	*8.1*	*8.1*	*4.5*	*1.9*	*1.6*	*1.4*	*1.1*	*0.4*	*0.3*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	—	*1.3*	*100.0*

TABLE 14. SEMI-MONTHLY DISTRIBUTION OF TOTAL MAN LABOR IN HOURS FOR EACH CROP

300 farms, Wuchin Hsien, Kiangsu, China (1924)

Months	First or second half	Late rice	Wheat	Early rice	Glutinous rice	Broad beans	Green manure	Wheat and field peas	Barley	Watermelons and soybeans	Rapeseed	Taro	Field peas	Vegetables	Arrowhead	Sesame	Soybeans	Sesame and red beans	Total hours
January	1st	...	3308	...	...	680	...	203	128	...	158	...	83	...	12	...	...	...	4572
	2nd	...	8922	...	...	174	...	326	270	...	56	...	22	...	38	...	...	...	9808
February	1st	...	2872	...	...	697	...	916	3	...	96	...	22	...	...	...	...	...	4606
	2nd	...	5701	...	...	714	...	305	350	...	225	...	22	...	...	...	...	...	7317
March	1st	...	4004	...	...	52	...	...	50	...	23	...	...	...	...	...	...	...	4129
	2nd	...	827	...	...	70	...	...	14	292	145	...	...	...	...	...	...	...	1348
April	1st	...	348	...	...	...	...	...	...	170	121	503	...	...	...	...	...	...	1142
	2nd	...	87	...	...	...	...	...	...	276	...	...	...	...	...	...	...	...	363
May	1st	3228	...	2503	...	...	2459	...	...	933	...	...	...	...	...	...	...	2	9125
	2nd	...	...	...	...	627	861	...	994	454	...	140	252	...	...	120	...	14	3444
June	1st	15823	19888	5179	...	5888	...	1485	...	195	...	129	241	...	...	...	15	1	48844
	2nd	22809	...	16185	3792	209	...	...	...	288	...	148	...	...	139	81	91	5	43747
July	1st	27995	...	16228	4249	...	...	...	...	343	...	74	...	...	112	16	14	13	49044
	2nd	23338	...	11351	3701	...	...	...	...	267	...	185	...	...	119	75	38	16	39090
August	1st	9684	...	4575	1142	...	...	...	...	68	...	...	...	407	66	11	54	3	16010
	2nd	3122	...	1899	822	...	...	...	...	...	...	...	...	254	4	...	...	...	6101
September	1st	2434	...	1360	868	...	...	...	...	...	...	...	...	179	...	182	...	...	5023
	2nd	2064	...	1230	366	...	...	...	...	...	...	41	...	...	...	...	...	28	3729
October	1st	1693	1654	20285	959	4846	5810	412	752	30	291	78	283	38	...	...	...	3	37184
	2nd	36779	22086	1899	2970	2686	990	727	510	415	448	96	217	68	...	...	106	31	70028
November	1st	...	2589	...	...	70	61	305	6	...	193	55	...	...	...	...	...	...	3279
	2nd	...	827	...	...	565	...	...	159	...	63	...	55	...	...	...	...	...	1669
December	1st	...	2568	...	...	...	...	305	133	...	88	...	...	...	...	...	...	...	3094
	2nd	...	13361	...	...	1550	...	712	483	...	137	...	...	...	38	...	...	...	16281
Total		*148969*	*89042*	*82694*	*18869*	*18828*	*10181*	*5696*	*3852*	*3731*	*2044*	*1449*	*1197*	*946*	*528*	*467*	*318*	*116*	*388927*
Percentage		*38.3*	*22.9*	*21.3*	*4.9*	*4.8*	*2.6*	*1.5*	*1.0*	*1.0*	*0.5*	*0.4*	*0.3*	*0.2*	*0.1*	*0.1*	*0.1*	—	*100.0*

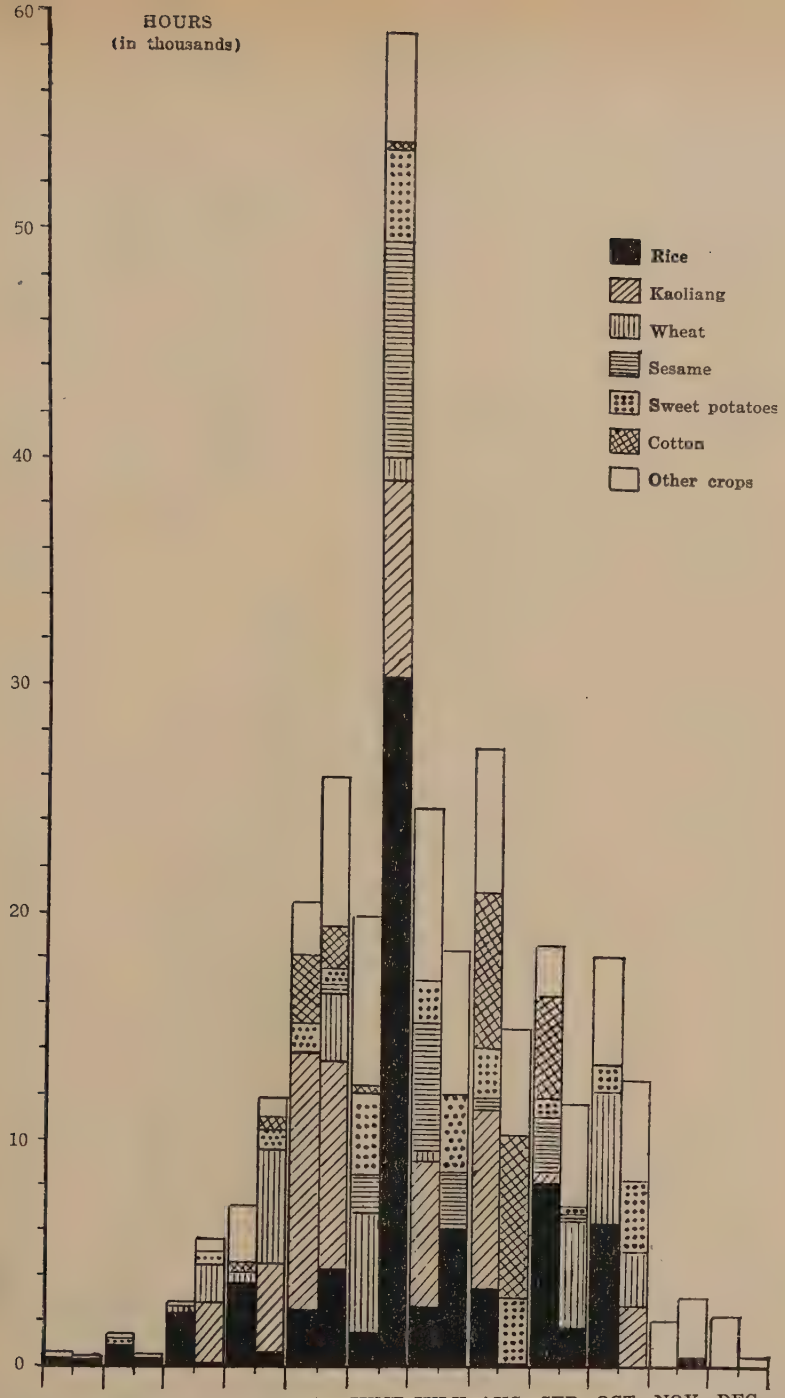

Fig. 3.—Semi-monthly distribution of total man labor in hours for all crops. 124 farms, Hwaiyuan Hsien, Anhwei, China (1924).

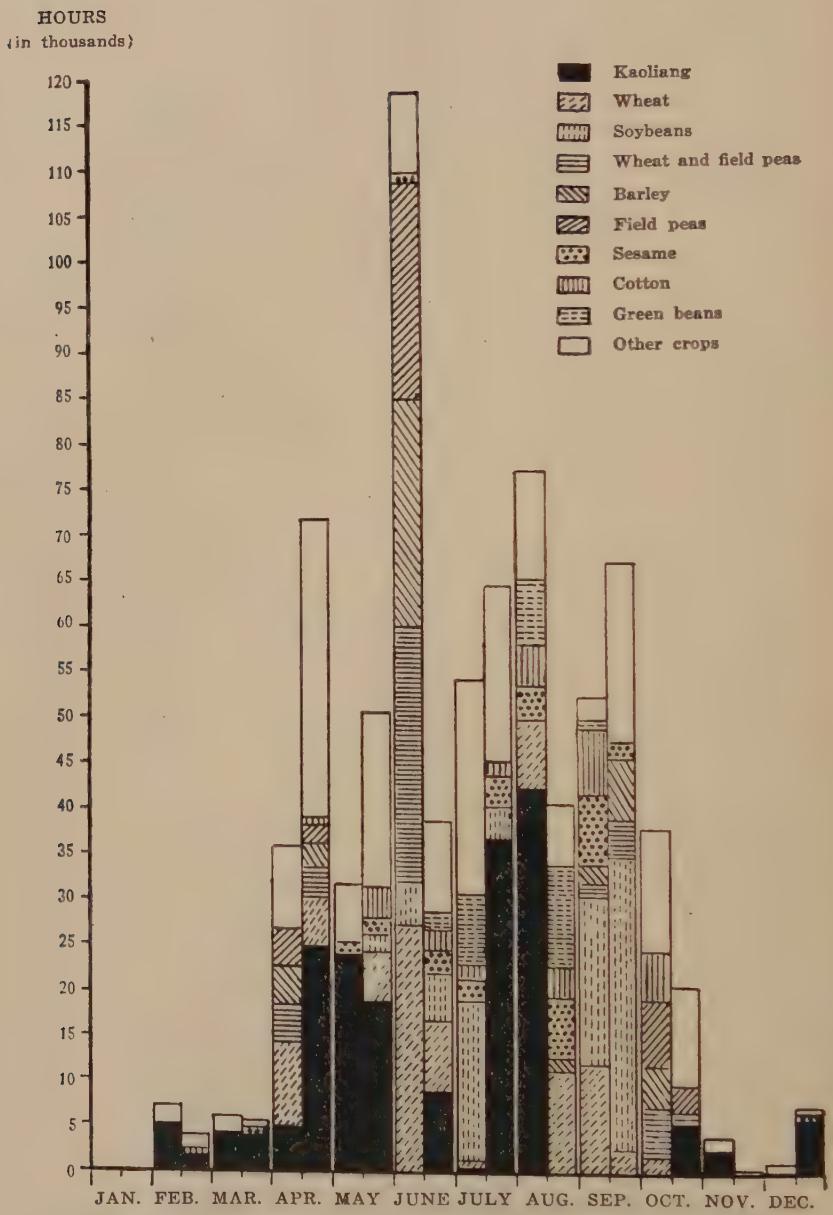

Fig. 4.—Semi-monthly distribution of total man labor in hours for all crops. 286 farms, Su Hsien, Anhwei, China (1924).

and in figures 3-11. Semi-monthly distribution of man labor for all other localities is shown in figs. 12 and 13. It is seen from these tables and figures that the problem of adjustment is one of distributing labor more evenly and thus avoiding the peaks of labor,

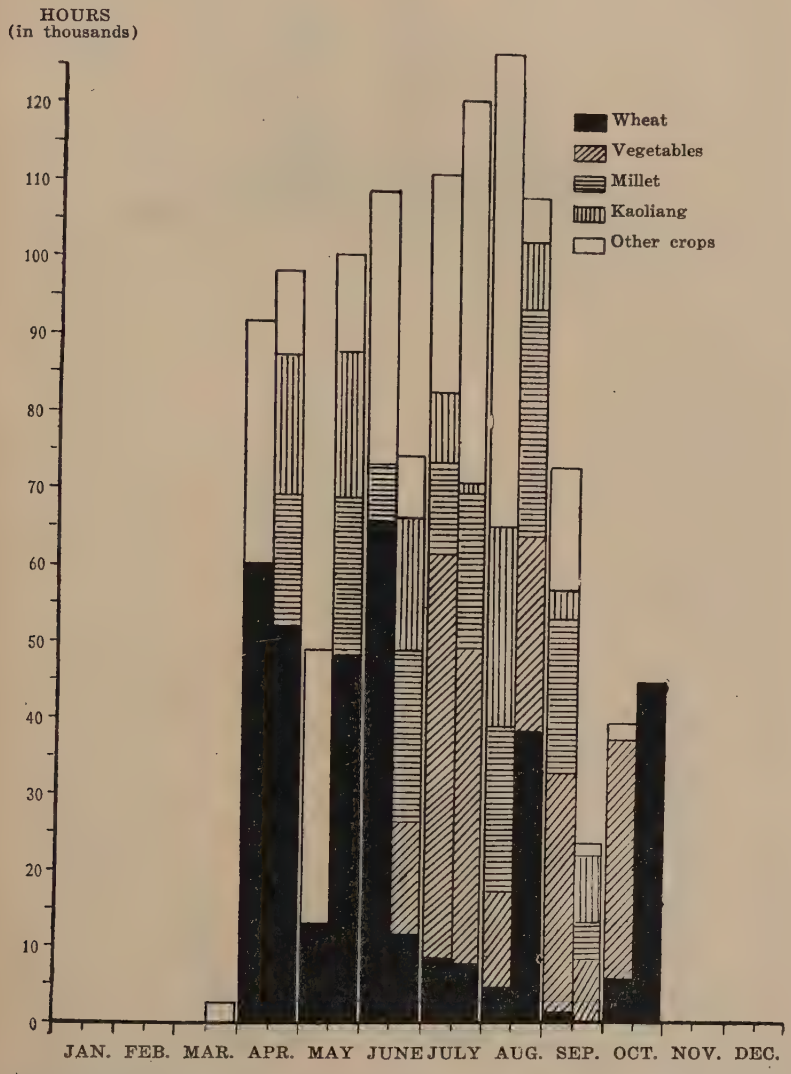

Fig. 5. Semi-monthly distribution of total man labor in hours for all crops. 152 farms, Pingsiang Hsien, Chihli, China (1923).

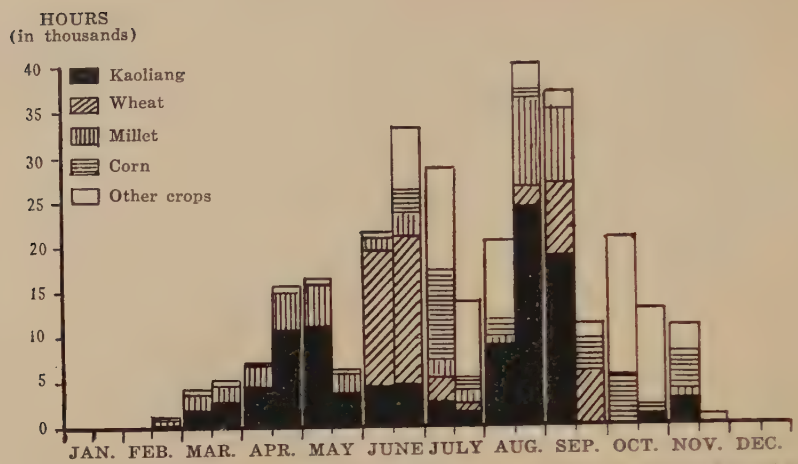

Fig. 6.—Semi-monthly distribution of total man labor in hours for all crops. 133 farms, Yenshan Hsien, Chihli, China (1923).

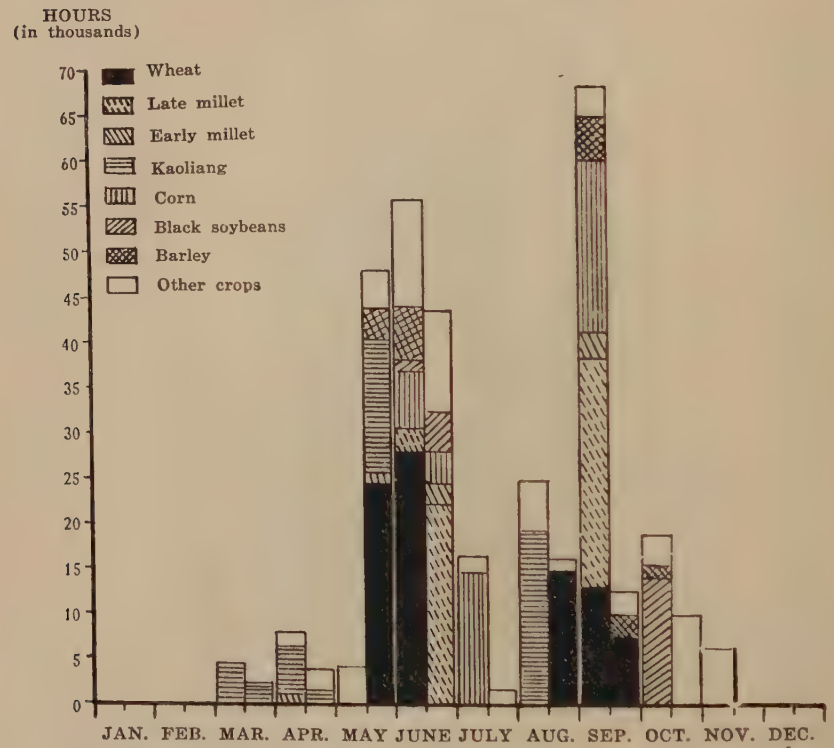

Fig. 7.—Semi-monthly distribution of total man labor in hours for all crops. 144 farms, Sincheng Hsien, Honan, China (1923).

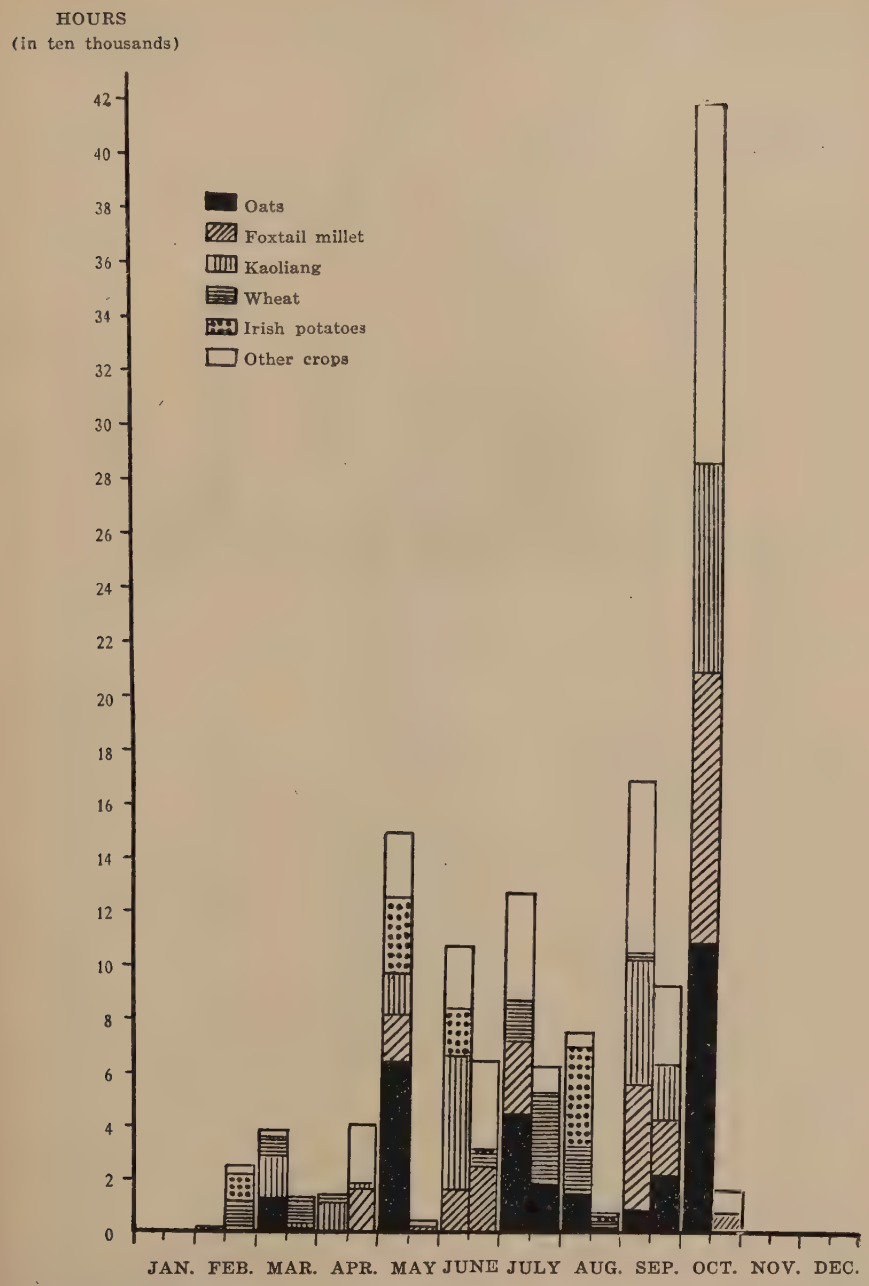

Fig. 8.—Semi-monthly distribution of total man labor in hours for all crops 226 farms, Wutai Hsien, Shansi, China (1922).

quite universal in late spring or early summer and in late summer or early fall, which necessitate the hiring of so much labor.

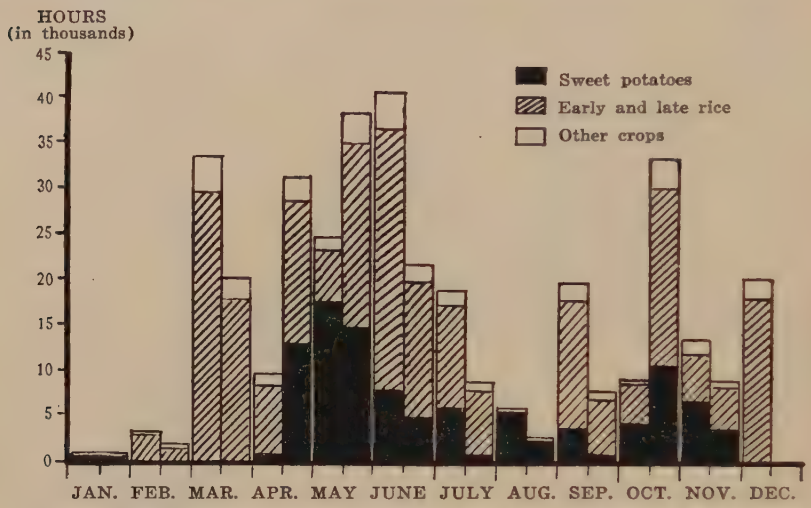

Fig. 9.—Semi-monthly distribution of total man labor in hours for all crops. 166 farms, Lienkiang Hsien, Fukien, China (1923).

Not only must the peaks be avoided, moreover, but the valleys, or periods of little work, must be filled. Such adjustment is not easy and it must be done with cognizance of all factors affecting or being affected by such a change. Accordingly, consideration must be given to the diet requirements of the farm family, to market demands, to a good cropping system from its various angles, and to labor supply and cost. As an aid to any such readjustment, it is necessary to know the labor requirements and time of year that different operations are performed for the different crops on a per unit of land basis. Such information is given for nine localities in tables 15-23. The kind of work is designated by letters after the amount of each kind of work per hectare. Where there is more than one kind of work for the same half month a number is given in parenthesis and it refers to a note enumerating different kinds of work occurring during the same half month.

From these tables dates of planting and of harvesting, the relative amounts of time required to do the same type of work in different localities may be ascertained. Differences in practice, including that of the extent to which animal labor is

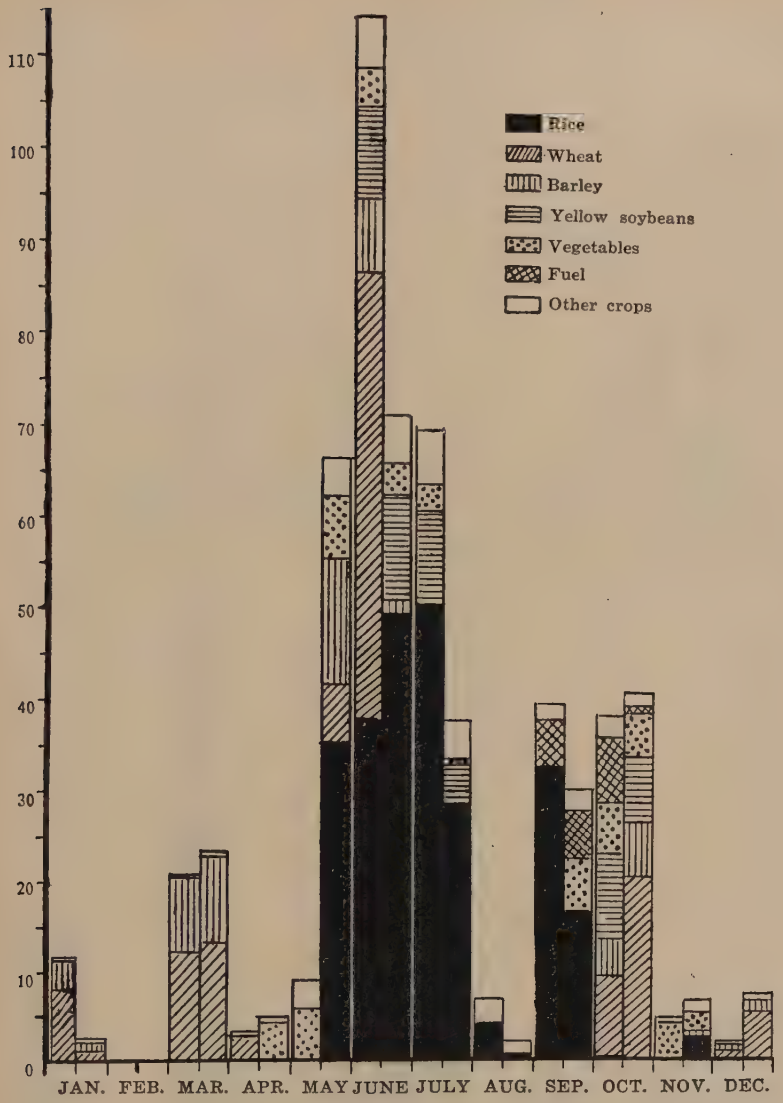

Fig. 10.—Semi-monthly distribution of total man labor in hours for all crops.
217 farms, Kiangning Hsien (T), Kiangsu, China (1924).

used, affect the amount of labor required. For instance, in North China animals are used for drilling and for carting fertilizer and harvested crops, whereas in East Central China all this work is done with human labor alone.

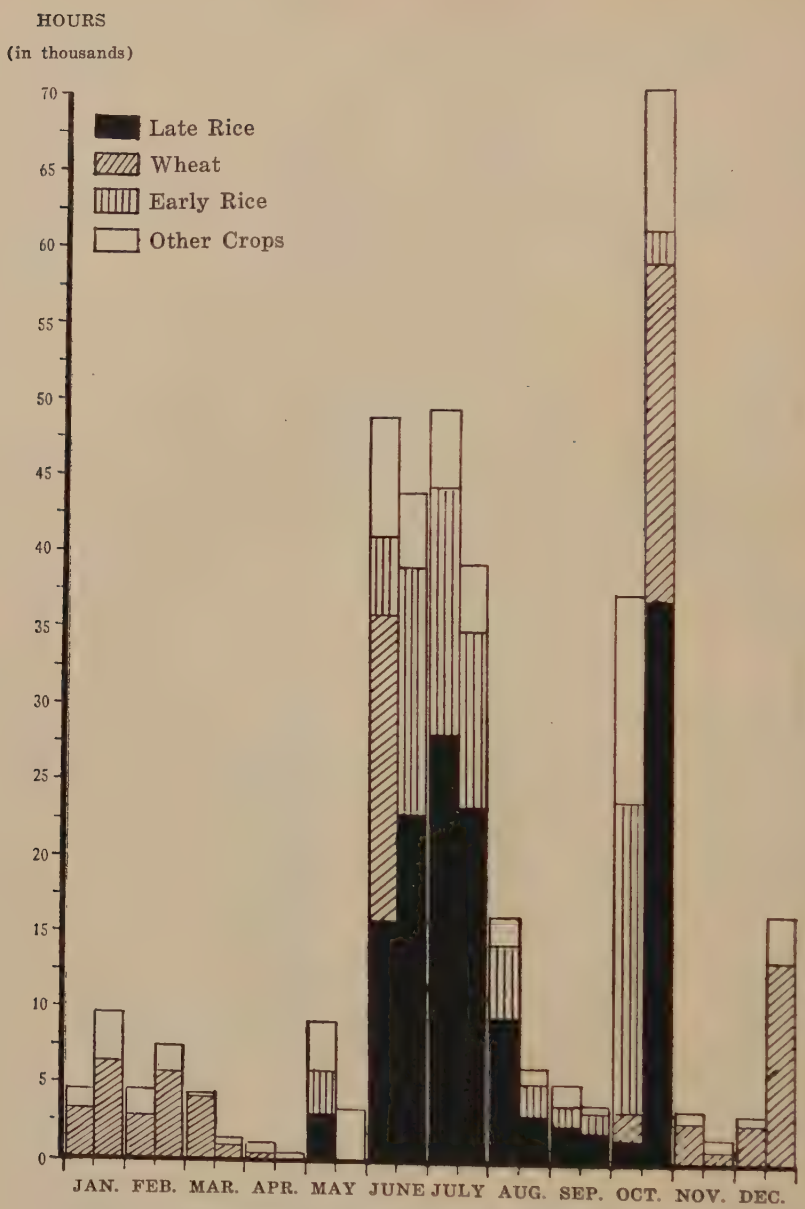

Fig. 11.—Semi-monthly distribution of total man labor in hours for all crops.

300 farms, Wuchin, Kiangsu, China (1923-1924).

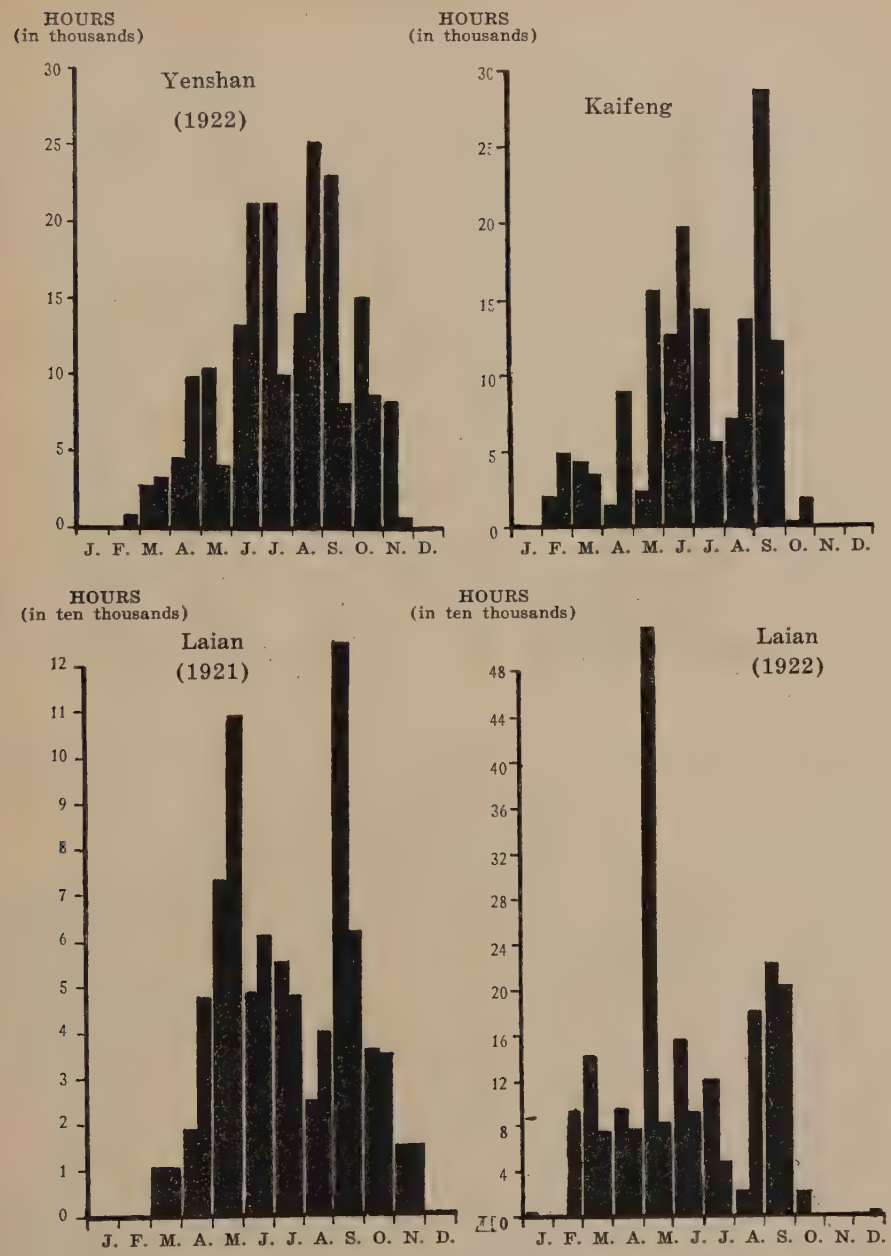

Fig. 12.—The semi-monthly distribution of all man labor in four localities, China.

Yenshan Hsien (1922) Chihli, 150 farms. Kaifeng Hsien, Honan, 149 farms (1924). Laian Hsien (1921) Anhwei, 101 fams. Laian Hsien (1922), 100 farms.

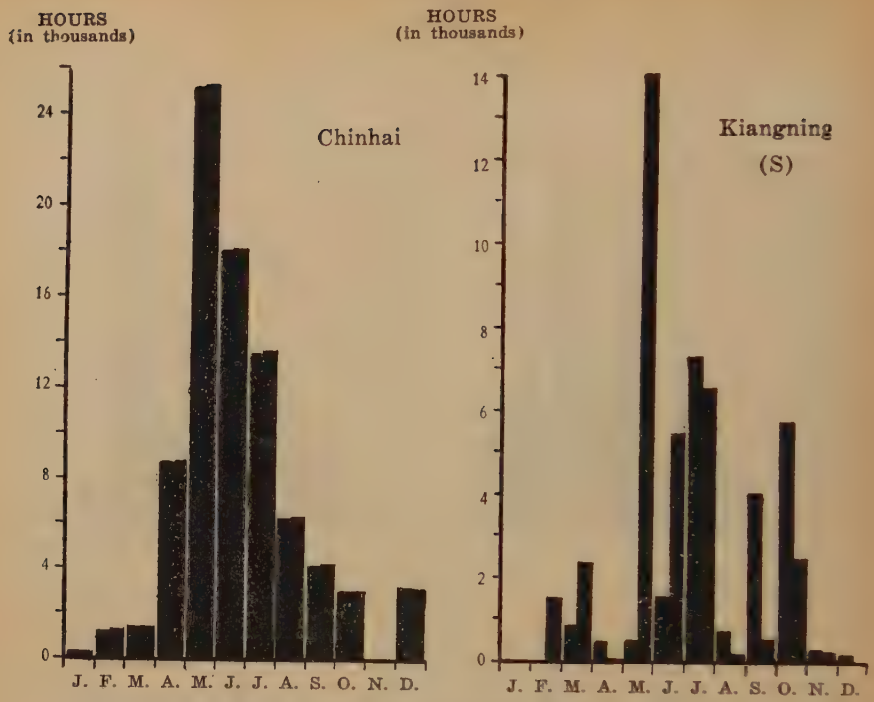

Fig. 13.—The semi-monthly distribution of all man labor in two localities, China

Chinhai Hsien, Chekiang, 67 farms (1921) Kiangning Hsien (S), Kiangsu, 203 farms (1923)

If the data and charts for each locality are studied carefully, some conclusions may be drawn about possible adjustments which should result in better labor distribution, in more diversified farming and consequent decreased risk, and in improving a diet now lacking in variety or even in the essentials of a good dietary. Adjustments for a few places are suggested below by way of illustration. Market demand is, of course, one of the limiting factors in making such changes.

Hwaiyuan Hsien, Anhwei

The distribution of man labor in Hwaiyuan would be fairly good if it were not for the one very high peak the last half of the month of June. Over one-half of the labor at this time is for transplanting rice while the remainder is largely for cultivation of kaoliang, sesame, and sweet potatoes, and some

34. *Two women and a child irrigating the newly-planted rice field at the left by means of the "ladder," or endless wooden chain pump. The water is taken from a lagoon.*

35. *Another view of irrigating a rice field from a pond, preparatory to planting.*

TABLE 15. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP*

124 farms, Hwaiyuan Hsien, Anhwei, China

MONTHS	First or second half	Tobacco	Muskmelons	Vegetables	Watermelons	Indigo	Carrots	Cotton	Peanuts
January	1st	...	...	18.5 Ht.	...	...	168.6 Ht.	4.5 M.	11.3
	2nd	...	...	...	...	...	518.6 Ht.	...	...
February ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	16.3	...	...	16.7 (1)	...
March	1st	143.3 Pt.	54.6	...	23.8	...	...	5.0 M.	...
	2nd	1078.3 Pt.	...	...	88.8	10.2	...	18.1 M.	18.8
April	1st	1235.0 Pt.	351.2	...	153.8 Pt.	39.5	...	38.8 (2)	...
	2nd	85.0	461.3	...	148.8	179.0 Pt.	...	40.3 (3)	525.4 Pt.
May..	1st	1515.0	2306.3	...	353.8 Pt.	455.0	...	285.2 C.	276.6
	2nd	2460.0	405.0 Pt.	...	731.2	618.8 Pt.	...	214.3 C.	276.6
June	1st	530.0	2334.6	...	626.2	221.5	...	68.3 C.	218.7
	2nd	623.3	2045.8 Ht.	...	503.7	473.2 Pt.	...	28.3 C.	...
July	1st	1123.3	340.0 Ht.	...	357.5 Ht.	546.0 .	358.6 Pt.	...	...
	2nd	2431.7 Ht.	...	951.9	1066.2 Ht.	409.5	88.6 Pt.	...	...
August	1st	1430.0 Ht.	810.4 Ht.	629.8 Pt.	135.0 Ht.	902.4 Ht.	917.1 Pt.	650.7 Ht.	...
	2nd	...	...	908.5 Pt.	...	83.4 Ht.	1077.1 Pt.	713.2 Ht.	...
September ..	1st	...	...	365.0	...	...	480.0	440.2 Ht.	...
	2nd	1820.0 Ht.	...	658.5 Pt.	...	...	90.0	...	...
October	1st	...	...	998.1	...	...	...	...	...
	2nd	...	...	739.3	...	...	...	...	961.7 Ht.
November ..	1st	...	...	850.3	...	...	...	...	...
	2nd	...	...	1206.1 Ht.	17.5	...	...	...	...
December ..	1st	103.4	9.2	1062.8 Ht.	...	...	...	2.2 M.	...
	2nd	...	15.4	18.5 Ht.	16.2	13.6	71.4 Ht.	14.5 M.	...
Total		*14578.3*	*9133.8*	*8407.3*	*4238.8*	*3952.1*	*3670.0*	*2540.3*	*2289.1*

*The kind of work each half-month is indicated by letters for tables 15-23. When there is more than one operation a number in parenthesis is given, and this is repeated at the bottom of the table for the different kinds of work. For the unimportant crops only planting and harvesting are indicated. The key to the abbreviations is as follows:

C or Ct. Cultivating
F. Fertilizing
Hw. Harrowing
Ht. Harvesting
It. Irrigating
Lc. Leaf cutting
M. Miscellaneous work
Mh. Making hills
Pp. Pumping
Pt. Planting
Pw. Plowing
St. Storing
Th. Threshing
Tp. Transplanting
Tv. Turning vines

(1) 14.2 F., 2.5 M.

(2) 27.1 Pw., 5.7 Hw., 2.9 F., 3.1 Pt.

(3) 21.4 Pw., 7.9 Hw., 6.4 F., 4.6 Pt.

TABLE 15.—*(Continued)*

Months	First or second half	Hemp	Millet	Sweet potatoes	Soybeans	Sesame and soybeans	Sesame and small beans	Kaoliang
January	1st	22.6	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
February	1st	12.5	...	8.8 M.	...	...	...	...
	2nd	...	...	...	...	...	...	...
March	1st	...	...	0.4 M.	...	...	...	...
	2nd	19.7 Pt.	...	21.5 (4)	...	...	...	27.7 F.
April	1st	47.9 Pt.	...	5.6 (5)	...	...	...	...
	2nd	68.9 Pt.	79.9 Pt.	27.8 It.	...	...	...	39.7 (14)
May	1st	488.5	59.9	43.9 It.	...	...	...	125.0 C.
	2nd	365.2	239.8	28.4 It.	...	34.3 Pt.	8.8 Pt.	100.7 C.
June	1st	134.6	207.0	132.5 (6)	63.4 Pt.	231.1 Pt.	114.0 Pt.	...
	2nd	181.6	119.9	152.0 (7)	84.1	139.0	300.0	95.5 C.
July	1st	300.6 Ht.	...	69.3 C.	287.6	69.5	...	71.5 C.
	2nd	325.7 Ht.	...	130.0 C.	134.1	98.0	115.5	...
August	1st	...	551.4 Ht.	88.6 (8)	39.1	...	...	88.1 (15)
	2nd	172.2 Ht.	...	103.6 (9)	...	...	...	...
September	1st	...	...	32.5 (10)	...	...	80.0 Ht.	4.9 Th.
	2nd	...	...	20.4 (11)	97.1 Ht.	160.4 Ht.	...	...
October	1st	...	...	54.6 (12)	...	...	...	...
	2nd	...	...	123.4 (13)	...	...	...	27.8 M.
November	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
December	1st	...	10.2	...	...	...	...	...
	2nd	...	33.4	...	...	...	...	...
Total		*2140.0*	*1301.5*	*1038.3*	*705.4*	*633.3*	*618.3*	*580.9*

(4) 3.9 Pw., 8.8 F., 4.7 Pt., 4.1 M.
(5) 1.7 F., 3.9 Pt.
(6) 6.9 It., 116.0 Mh., 9.6 Tv.
(7) 143.3 Tp., 8.7 Mh.
(8) 72.6 C., 12.8 Mh., 3.2 M.
(9) 32.4 C., 57.4 Mh., 5.8 Tv., 8.0 M.
(10) 12.1 C., 8.7 Tv., 11.7 M.
(11) 11.6 Tv., 8.8 M.
(12) 47.3 Ht., 7.3 St.
(13) 100.2 Ht., 23.2 St.
(14) 22.8 Pw., 8.0 Hw., 8.9 Pt.
(15) 72.5 Ht., 15.6 Th.

TABLE 15.—*(Continued)*

Months	First or second half	Sesame	Rice	Green beans	Wheat and field peas	Barley	Wheat	Other crops
January	1st	...	2.8 F.	...	...	...	...	11.1
	2nd	...	2.8 F.	...	...	...	...	...
February	1st	...	5.9 (20)	...	...	...	...	...
	2nd	...	2.4 (21)	...	...	...	...	...
March	1st	...	12.8 (22)	...	5.5	...	1.7 C.	...
	2nd	...	0.7 (23)	...	38.2	1.7 C.	7.6 C.	...
April	1st	...	20.2 (24)	...	...	28.0 C.	2.0 C.	...
	2nd	...	3.8 (25)	...	...	...	23.8 C.	3.9
May	1st	...	12.4 (26)	...	...	...	...	2.9
	2nd	7.4 (16)	22.8 C.	...	...	95.1	12.7 Ht.	11.5
June	1st	41.0 (17)	7.8 (27)	...	124.6 Ht.	...	24.1 (35)	10.0
	2nd	228.4 (18)	163.3 (28)	3.6 Pt.	7.3	...	3.7 (36)	7.1
July	1st	137.4 C.	13.5 (29)	22.8 Pt.	...	...	1.7 Th.	8.6
	2nd	60.1 C.	32.2 (30)	15.5 Pt.	...	...	...	577.5
August	1st	6.4 C.	18.5 (31)	66.5	6.7	1.8 M.	...	429.9
	2nd	...	0.9 C.	109.2	20.1	3.6 M.	...	586.8
September	1st	63.1 (19)	42.9 (32)	33.2	6.1	13.2 M.	...	231.8
	2nd	5.7 Th.	9.6 (33)	...	21.4	9.1	20.6 F.	395.5
October	1st	...	33.6 (34)	56.0 Ht.	39.1 Pt.	19.6	26.7 (37)	620.5
	2nd	...	...	44.5 Ht.	14.6 Pt.	27.4	10.5 (38)	460.8
November	1st	...	...	...	...	7.1	...	510.6
	2nd	...	2.5 M.	...	...	...	...	724.3
December	1st	...	...	...	...	...	...	638.5
	2nd	...	...	...	...	...	...	12.8
Total		*549.5*	*411.4*	*351.3*	*283.6*	*206.6*	*135.1*	*5244.1*

(16) 4.9 Pw., 1.4 Hw., 1.1 Pt.
(17) 27.9 Pw., 7.0 Hw., 0.7 F., 5.4 Pt.
(18) 5.9 Pw., 1.2 Hw., 220.4 C., 0.9 Pt.
(19) 41.8 Ht., 21.3 Th.
(20) 0.4 F., 5.5 M.
(21) 0.3 F., 2.1 M.
(22) 4.3 Pw., 1.2 Hw., 2.7 F., 2.5 Pt., 2.1 M.
(23) 0.3 F., 0.4 M.
(24) 8.2 Pw., 2.0 Hw., 0.4 F., 6.7 C., 2.9 Pt.
(25) 1.0 Pw., 0.2 Hw., 2.4 C., 0.2 Pt.
(26) 11.9 C., 0.5 Tp.
(27) 6.4 Pw., 1.4 Hw.
(28) 24.5 Pw., 5.2 Hw., 5.6 C., 128.0 Tp.
(29) 0.2 F., 13.3 C.
(30) 2.2 F., 30.0 C.
(31) 0.4 F., 18.1 C.
(32) 31.4 Ht., 11.5 Th.
(33) 7.1 Ht., 2.5 Th.
(34) 22.4 Ht., 11.2 Th.
(35) 10.0 Ht., 14.1 Th.
(36) 1.4 Ht., 2.3 Th.
(37) 14.8 Pw., 3.8 Hw., 3.7 F., 4.4 Pt.
(38) 7.4 Pw., 1.5 Hw., 1.6 Pt.

TABLE 16. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

286 farms, Su Hsien, Anhwei, China (1924)

Months	First or second half	Sugar Cane	Vegetables	Melons and tobacco	Water-melons	Melons and cotton	Melons and squash	Tobacco	Squash and corn
February ..	1st	28.8	236.6 Ht.	372.5 Pt.	15.2	110.0	80.0	595.0 Pt.	166.3
	2nd	518.8 Pt.	...	...	5.1	...	5.0	...	...
March	1st	...	33.8 Ht.	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
April	1st	228.8	1064.8 Ht.	435.4 Pt.	415.6	...	...	...	620.0 Pt.
	2nd	1305.0	1064.8 Pt.	1080.4 Pt.	444.0 Pt.	692.5 Pt.	845.0 Pt.	405.0	310.0 Pt.
May	1st	423.8	528.2 Ht., Pt.	290.4	...	173.8	257.5	...	97.5
	2nd	688.8	211.3	895.8	822.3 Pt.	302.5	500.0	75.0	507.5
June	1st	870.0	422.5 Ht.	573.3	961.4	550.0	750.0	150.0	181.3
	2nd	1196.3	549.3 Ht., Pt.	1039.2	1138.6	165.0	250.0	250.0	362.5
July	1st	1160.0	338.0 Ht., Pt.	537.5 Ht.	834.9 Ht.	137.5 Ht.	225.0	350.0	...
	2nd	1486.2	813.4 Ht., Pt.	430.0 Ht.	721.1 Ht.	137.5 Ht.	300.0	275.0	72.5 Ht.
August	1st	1305.0	781.7 Ht.	286.7 Ht.	253.0 Ht.	192.5 Ht.	275.0	250.0 Ht.	200.0 Ht.
	2nd	1268.7	232.4 Ht.	...	25.3	220.0 Ht.	...	...	36.2 Ht.
September ..	1st	978.7	1098.6 Ht.	...	...	302.5 Ht.	...	...	...
	2nd	616.2	528.2 Ht., Pt.	...	...	275.0 Ht.	...	...	...
October	1st	435.0	845.1 Ht.	...	...	275.0 Ht.	...	...	...
	2nd	1305.0 Ht.	190.1	483.9 Ht.	...	260.0 Ht.	...	393.8 Ht.	...
November ..	1st	116.2	67.6	57.5	15.2	77.5	20.0	75.0	137.5
	2nd	...	202.8 Ht.	57.5	10.1	...	...	...	...
December ..	1st	...	405.6 Ht.	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
Total		*13931.3*	*9614.3*	*6540.0*	*5661.3*	*3871.3*	*3507.5*	*2818.8*	*2691.3*

TABLE 16.—*(Continued)*

Months	First or second half	Irish potatoes	Onions	Peanuts	Cotton	Hemp	Squash	Broad beans
February	1st	...	...	17.6	15.6	8.1	37.5	...
	2nd	...	...	20.7	23.4	3.8	...	...
March	1st	...	...	26.9	1.5	24.8	...	...
	2nd	...	...	52.3	...	24.8 Pt.	...	...
April	1st	98.2 Pt.	...	20.9 Pt.	4.4	21.2 Pt.	35.0	48.9
	2nd	453.6 Pt.	335.0 Pt.	173.3 Pt.	28.0 Pt.	94.5	344.6 Pt.	32.5
May	1st	54.5	...	4.6	...	123.2	42.1	...
	2nd	236.4	157.5	106.2	132.0	54.9	172.1	...
June	1st	72.7	...	33.6	...	...	31.2	343.9 Ht.
	2nd	72.7	282.5 Pt.	102.3	77.9	...	93.7	...
July	1st	309.1	67.5	66.4	64.2	247.6 Ht.	109.6	...
	2nd	145.5	247.5	7.8	56.4	554.3 Ht.	15.8	...
August	1st	145.5	90.0	...	175.2 Ht.	...	172.1 Ht.	...
	2nd	90.9	125.0	...	140.2 Ht.	...	47.1	...
September	1st	...	135.0	...	280.4 Ht.	...	...	135.8 Pt.
	2nd	290.9 Ht.	57.5	...	7.8 Ht.	...	...	108.6 Pt.
October	1st	181.8 Ht.	67.5	175.7	210.3 Ht.	...	...	199.1 Pt.
	2nd	...	182.5 Ht.	883.8 Ht.	15.8 Ht.	12.7	...	40.8 Pt.
November	1st	...	235.0 Ht.	21.9	12.4	11.8	37.5	...
	2nd	...	...	2.1	4.7	...	...	...
December	1st	...	...	10.6	...	2.2	...	...
	2nd	...	...	5.2	15.6	15.1	...	...
Total		*2151.8*	*1982.5*	*1731.9*	*1265.8*	*1199.0*	*1133.3*	*909.6*

TABLE 16.—*(Continued)*

Months	First or second half	Winter radish	Kaoliang	Carrots	Corn	Sesame	Millet	Proso Millet
February	1st	...	22.7 F.	...	...	4.5	15.8	13.4
	2nd	...	8.4 (1)	...	...	5.6	28.1	43.0
March	1st	...	20.0 (2)	...	...	2.3	23.4	12.9
	2nd	...	17.2 (3)	...	...	11.4	14.6	6.5
April	1st	...	21.7 (4)	...	64.3	1.3	...	...
	2nd	...	108.9 Ct.	...	208.9 Pt.	4.4 Pt.	18.4 Pt.	23.1 Pt.
May	1st	...	104.7 Ct.	...	...	20.3	34.2	51.3
	2nd	...	80.6 Ct.	...	53.6	33.8	61.9	13.8
June	1st	...	...	...	17.9	26.0 Pt.	14.1	44.2
	2nd	...	39.2 Ct.	...	35.7	50.6 Pt.	49.3	14.3
July	1st	75.0 Pt.	2.2 Ct.	11.9 Pt.	35.7	42 2	...	...
	2nd	31.4 Pt.	159.4 (5)	42.8 Pt.	...	61.1	50.7 Ht.	157.6 Ht.
August	1st	150.0 Pt.	186:6 (6)	147.1 Pt.	205.3 Ht.	71.8 Ht.	26.7 Ht.	...
	2nd	75.0	...	163.0	...	119.6 Ht.	...	...
September	1st	212.5	...	107.4	...	126.6 Ht.	...	...
	2nd	...	...	...	...	28.1	...	...
October	1st	...	...	...	...	...	...	2.1
	2nd	...	23.8 (7)	...	...	6.3	131.7	25.8
November	1st	180.0 Ht.	11.6 Pw.	146.3 Ht.	50.0	...	10.7	7.7
	2nd	130.0 Ht.	0.4 Pw.	139.9 Ht.	...	...	...	...
December	1st	...	1.3 Pw.	...	...	...	12.4	13.4
	2nd	...	26.2 Pw.	...	...	10.1	17.4	19.1
Total		*853.9*	*834.9*	*758.4*	*671.4*	*626.0*	*509.4*	*448.2*

(1) 0.4 Hw., 8.0 F.
(2) 19.5 Pw., 0.5 Hw.
(3) 8.5 Pw., 8.7 Hw.
(4) 0.5 Pw., 3.7 Hw., 13.0 Pt., 4.5 M.
(5) 2.2 Ct., 157.2 L.C.
(6) 116.1 Ht., 39.9 Th., 30.6 M.
(7) 17.8 Pw., 5.0 Th., 1.0 M.

TABLE 16.—*(Continued)*

Months	First or second half	Thatching grass	Field peas	Barley (hulless)	Buckwheat	Barley and field peas	Wheat and field peas	Barley
February	1st	...	...	...	...	...	...	...
	2nd	4.1	...	...	...	...	...	...
March	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
April	1st	120.6 Pt.	33.8 Ct.	36.4	...	29.6	21.4 Ct.	13.6 Ct.
	2nd	20.9	16.0 Ct.	4.0	...	4.8	15.2 Ct.	12.5 Ct.
May	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
June	1st	...	193.8 (8)	151.6 Ht.	...	142.7 Ht.	138.8 (11)	117.2 (16)
	2nd	...	...	...	...	...	...	...
July	1st	51.6 Pt.	...	...	...	...	...	...
	2nd	46.6	...	...	...	...	...	2.1 Pw.
August	1st	...	...	...	...	2.6	...	1.0 Pw.
	2nd	...	...	...	62.9 Pt.	6.1	...	4.2 (17)
September	1st	...	...	...	46.3 Pt.	12.6	7.5 (12)	11.8 (18)
	2nd	...	...	27.3 Pt.	19.2	40.4 Pt.	20.0 (13)	31.0 (19)
October	1st	...	58.4 (9)	43.6 Pt.	31.7 Ht.	20.8 Pt.	30.5 (14)	18.6 (20)
	2nd	46.5 Ht.	22.3 (10)	6.9 Pt.	100.4 Ht.	...	6.8 (15)	2.1 (21)
November	1st	119.7 Ht.	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
December	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
Total		*410.0*	*324.3*	*269.8*	*260.5*	*259.6*	*240.2*	*219.2*

(8) 87.0 Ht., 90.9 Th., 15.9 M.
(9) 25.8 Pw., 9.9 Hw., 13.8 F., 8.9 Pt.
(10) 12.5 Pw., 4.5 Hw., 5.3 Pt.
(11) 75.5 Ht., 41.8 Th., 21.5 M.
(12) 3.5 Pw., 0.6 Hw., 2.3 F., 1.1 Pt.
(13) 12.8 Pw., 3.2 Hw., 1.7 F., 2.3 Pt.
(14) 14.5 Pw., 8.2 Hw., 2.3 F., 5.5 Pt.
(15) 4.2 Pw., 1.0 Hw., 1.6 Pt.
(16) 60.7 Ht., 46.1 Th., 10.4 M.
(17) 2.1 Pw., 2.1 F.
(18) 7.3 Pw., 1.6 Hw., 2.9 F.
(19) 19.9 Pw., 5.5 Hw., 1.6 F., 4.0 Pt.
(20) 8.4 Pw., 2.2 Hw., 8.0 Pt.
(21) 1.1 Hw., 1.0 Pt.

TABLE 16.—*(Continued)*

Months	First or second half	Wheat	Black soybeans	Green beans	Red beans	Rice	Soybeans	Other crops
February	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
March	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
April	1st	21.8 Ct.	...	...	...	...	...	97.7
	2nd	12.5 Ct.	...	...	...	...	...	451.2
May	1st	...	...	...	...	...	...	54.3
	2nd	14.1 (22)	2.7 Pt.	...	3.0 Pt.	3.1 Pt.	3.3 Pt.	235.1
June	1st	62.5 (23)	9.1 Pt.	1.0 Pt.	10.1 Pt.	6.2 Pt.	9.9 Pt.	72.3
	2nd	17.6 (24)	13.8	13.3 Pt.	23.0 Pt.	24.6 Pt.	10.5 Ct.	72.3
July	1st	1.9 M.	32.9	48.3	30.4	18.6	35.9 Ct.	307.4
	2nd	0.9 Pw.	6.0	1.0 Pt.	4.0	...	7.5 Ct.	144.7
August	1st	15.8 (25)	...	43.4 Ht.	16.9 Ht.	...	...	144.7
	2nd	26.6 (26)	...	69.8 Ht.	78.3 Ht.	...	...	90.4
September	1st	27.3 (27)	26.2 Ht.	6.5 Ht	14.9 Ht.	24.8 Ht.	38.2 (30)	...
	2nd	5.6 (28)	73.9 Ht.	...	...	86.9 Ht.	66.7 (31)	289.4
October	1st	4.0 (29)	22.2 Ht.	...	...	14.5 Ht.	...	180.8
	2nd	...	...	...	...	...	...	...
November	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
December	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
Total		*210.6*	*186.3*	*183.3*	*180.6*	*178.7*	*172.0*	*2140.3*

(22) 7.5 Ht., 5.0 Th., 1.6 M.
(23) 40.3 Ht., 19.4 Th., 2.8 M.
(24) 12.5 Th., 5.1 M.
(25) 10.9 Pw., 1.1 Hw., 3.8 F.
(26) 18.1 Pw., 3.5 Hw., 5.0 F.
(27) 15.6 Pw., 2.8 Hw., 0.6 F., 7.0 Pt., 1.3 M.
(28) 0.6 Pw., 1.4 Hw., 0.2 F., 3.4 Pt.
(29) 0.3 Hw., 3.0 Pt., 0.7 M.
(30) 23.1 Ht., 11.2 Th., 3.9 M.
(31) 39.8 Ht., 20.6 Th., 6.3 M.

TABLE 17. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

152 farms, Pingsiang Hsien, Chihli, China (1923)

Months	First or second half	Vegetables	Hemp	Wheat	Millet	Soybeans	Kaoliang	Other crops
March	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	5.0
April	1st	...	...	135.5 (6)	...	...	...	60.4
	2nd	...	187.7 Pt.	117.3 It.	43.2 (11)	57.3 Pt.	58.9 (19)	1.3
May	1st	...	82.5	29.4 It.	...	...	...	61.5
	2nd	...	1749	108.5 It.	52.3 Ct.	58.2	61.2 Ct.	5.8
June	1st	...	116.7	148.1 (7)	18.6 (12)	...	...	57.1
	2nd	147.5 Pw.	...	26.2 Pw.	57.1 (13)	59.9	56.7 Ct.	13.2
July	1st	527.1 (1)	255.2 Ht.	19.1 Pw.	30.1 (14)	...	29.5 Ct.	30.2
	2nd	412.0 (2)	635.6	17.8 (8)	51.1 (15)	45.9	4.5 Ct.	33.6
August	1st	123.4 (3)	...	11.0 (9)	55.8 (16)	...	83.9 (20)	118.6
	2nd	251.5 (4)	...	87.0 (10)	75.3 (17)	184.9 Ht.	29.8 (21)	5.1
September	1st	310.9 (5)	...	3.4 Pt.	51.6 (18)	...	12.5 M.	30.9
	2nd	85.3 It.	11.4	...	12.8 Pw.	34.9	28.6 Pw.	0.5
October	1st	313.9 Ht.	...	13.4 It.	...	...	...	3.8
	2nd	...	...	101.8 It.	...	...	...	...
November	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
December	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
Total		*2171.6*	*1464.0*	*818.5*	*447.9*	*441.1*	*365.6*	*427.3*

(1) 84.9 Hw., 180.6 F., 261.4 Pt.
(2) 188.3 It., 223.7 Ct.
(3) 103.3 It., 20.1 Ct.
(4) 83.2 It., 168.3 Ct.
(5) 134.0 It., 176.9 Ct.
(6) 108.8 It., 26.7 Ct.
(7) 75.4 Ht., 52.7 Th., 20.0 M.
(8) 16.9 Pw., 0.9 Hw.
(9) 4.6 Pw., 6.4 Hw.
(10) 16.3 Pw., 6.3 Hw., 26.3 F., 22.1 Pt., 16.0 M.
(11) 27.9 Pw., 5.3 Hw., 10.0 Pt.
(12) 11.1 Pw., 2.5 Hw., 4.0 F., 1.0 Pt.
(13) 4.0 Pt., 53.1 Ct.
(14) 6.0 It., 24.1 Ct.
(15) 24.1 It., 24.0 Ct., 3.0 Ht.
(16) 18.0 It., 33.7 Ht., 3.6 Th., 0.5 M.
(17) 24.7 Ht., 42.8 Th., 7.8 M.
(18) 13.5 Pw., 33.5 Th., 4.6 M.
(19) 40.8 Pw., 8.1 Hw., 10.0 Pt.
(20) 64.8 Ht., 11.6 Th., 7.5 M.
(21) 22.1 Th., 7.7 M.

TABLE 18. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

133 farms, Yenshan Hsien, Chihli, China (1923)

Months	First or Second half	Kaoliang	Corn	Millet	Wheat	Other crops
February ..	1st	...	...	...	...	1.0
	2nd	2.6 F.	...	10.9 (17)	...	1.4
March	1st	16.6 (1)	...	22.0 (18)	0.6 M.	3.0
	2nd	22.7 (2)	...	27.6 (19)	...	2.2
April	1st	35.6 (3)	...	31.3 Pt.	...	2.5
	2nd	85.0 (4)	...	58.8 (20)	...	4.1
May..	1st	85.8 (5)	...	69.2 (21)	...	4.5
	2nd	25.1 Ct.	...	39.9 (22)	...	2.7
June	1st	33.2 Ct.	...	24.0 Ct.	59.9 (29)	2.4
	2nd	87.2 Ct.	59.4 (10)	29.6 Ct.	65.4 (30)	42.1
July	1st	21.9 Ct.	202.0 (11)	33.6 Ct.	9.4 (31)	73.5
	2nd	11.7 Ct.	42.7 Ct.	19.6 Ct.	3.1 (32)	52.6
August	1st	67.2 L.C.	39.0 Ct.	16.0 (23)	...	55.7
	2nd	185.4 (6)	21.3 Ct.	140.1 (24)	10.5 (33)	16.3
September ..	1st	145.9 (7)	14.7 (12)	114.2 (25)	32.0 (34)	9.1
	2nd	...	70.4 (13)	1.6 Th.	23.4 (35)	11.5
October	1st	...	112.6 (14)	...	1.5 Pt.	96.6
	2nd	8.3 (8)	19.3 (15)	...	...	70.1
November ..	1st	21.8 (9)	84.4 Th.	15.8 (26)	...	19.7
	2nd	...	9.1 (16)	5.1 (27)	...	1.5
December ..	1st	...	...	1.9 (28)	...	0.1
	2nd	...	...	...	...	...
Total		*806.0*	*674.9*	*661.2*	*205.8*	*472.6*

(1) 3.5 Pw., 2.1 Hw., 11.0 F.
(2) 10.7 Pw., 8.3 Hw., 3.7 F.
(3) 7.0 F., 28.6 Pt.
(4) 45.3 F., 39.7 Ct.
(5) 7.3 F., 78.5 Ct.
(6) 72.9 Ht., 112.5 M.
(7) 56.5 Th., 89.4 M.
(8) 5.1 Pw., 3.2 Hw.
(9) 13.8 Pw., 8.0 Hw.
(10) 20.3 Pw., 8.0 Hw., 2.8 F., 28.3 Pt.
(11) 7.5 Hw., 74.3 F., 120.2 Ct.
(12) 7.9 Ct., 6.8 Ht.
(13) 64.5 Ht., 3.4 Th., 2.5 M.
(14) 9.5 Ht., 103.1 M.
(15) 5.1 Th., 14.2 M.
(16) 7.6 Th., 1.5 M.
(17) 1.9 F., 9.0 M.
(18) 4.5 Pw., 2.5 Hw., 13.7 F., 1.3 M.
(19) 12.6 Pw., 6.0 Hw., 9.0 F.
(20) 54.8 F., 4.0 Ct.
(21) 22.8 F., 46.4 Ct.
(22) 6.4 F., 33.5 Ct.
(23) 8.0 Ht., 8.0 Th.
(24) 81.5 Ht., 58.6 M.
(25) 32.8 Th., 81.4 M.
(26) 10.5 Pw., 5.3 Hw.
(27) 3.8 Pw., 1.3 Hw.
(28) 1.3 Pw., 0.6 Hw.
(29) 50.6 Ht., 9.3 M.
(30) 2.3 Pw., 4.7 Ht., 27.7 Th., 30.7 M.
(31) 2.6 Th., 6.8 M.
(32) 2.3 Pw., 0.8 Hw.
(33) 6.2 Pw., 1.2 Hw., 2.3 F., 0.8 M.
(34) 18.4 Pw., 7.4 Hw., 6.2 Pt.
(35) 1.6 Pw., 1.9 Hw., 19.9 Pt.

work on a number of other crops. This peak means that if no more labor were hired than the average man-equivalent of 2.21 men for the year, then each person would be working over fourteen hours per day during the last half of June. Actually this is not true, since a large proportion of the hired labor is hired at that time. But a few changes could be made and this peak reduced. Soybeans might be planted to a greater extent or corn might be introduced and also planted with the soybeans. These crops are easily planted after wheat harvest without much labor. Whether the profits, year after year, would be as great requires further study. Other possibilities are the planting of millet after wheat as is done in Shantung, and the planting of

TABLE 19. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

144 farms, Sincheng Hsien, Honan, China (1923)

Months	First of second half	Corn	Sesame	Seed melons	Kaoliang	Early millet	Sweet potatoes	Late millet	Millet and green beans
January	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
February	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
March	1st	...	...	...	66.9 F.	...	...	...	...
	2nd	...	...	...	31.2 F.	...	...	...	...
April	1st	...	...	103.2	78.9 (2)	106.0	...	...	...
	2nd	...	99.1	51.7	23.8 Pt.	...	...	...	...
May	1st	...	...	27.2 Pt.	...	13.9	108.7 F.	...	...
	2nd	...	159.9 Pt.	...	215.2 Ct.	92.1 Pt.	52.1 (4)	...	...
June	1st	108.3 F.	277.7	233.0	...	...	93.6 Pt.	30.2 Pt.	27.4 Pt.
	2nd	64.5 Pt.	...	...	...	211.3	185.2 Ct.	249.2 Ct.	...
July	1st	261.1 Ct.	...	86.0	...	...	...	...	228.6
	2nd	...	...	...	...	...	...	...	...
August	1st	...	...	211.5 Ht.	282.1 (3)	...	...	...	...
	2nd	...	88.8 Ht.	...	...	...	...	...	...
September	1st	336.8 (1)	95.1	...	...	264.1 Ht.	...	281.1 (5)	228.5 Ht.
	2nd	...	...	...	...	...	...	...	...
October	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
November	1st	...	...	...	...	...	200.1 Ht.	...	...
	2nd	...	...	...	...	...	...	...	...
December	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
Total		*770.7*	*720.6*	*712.6*	*689.1*	*687.4*	*639.7*	*560.5*	*484.5*

(1) 193.3 Ht., 143.5 Th.
(2) 65.1 Pw., 13.8 Hw.
(3) 170.1 Ht., 112.0 Th.
(4) 35.8 Pw., 16.3 Hw.
(5) 91.6 Ht., 189.5 Th.

TABLE 19.—*(Continued)*

Months	First or second half	Barley	Buckwheat	Green beans	Sesame and green beans	Black soybeans	Wheat	Other crops
January	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
February	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
March	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
April	1st	...	...	...	...	...	...	12.5
	2nd	...	...	...	...	...	...	6.3
May	1st	...	...	...	...	...	...	3.3
	2nd	82.3 Ht.	...	...	...	...	85.4 Ht.	6.4
June	1st	135.5 Th.	...	27.4 Pt.	24.2 Pt.	22.4 Pt.	97.8 Th.	53.5
	2nd	...	...	197 2	...	74.6 Ct.	...	59.9
July	1st	...	...	...	211.3	...	...	10.4
	2nd	...	83.7	...	...	...	...	...
August	1st	...	99.8 Pt.	...	...	...	...	25.6
	2nd	...	...	...	...	...	52.1 F.	3.9
September	1st	101.8 F.	33.5	64.5 Ht.	...	...	46.1 (8)	3.4
	2nd	50.1 (6)	...	107.6 Ht.	158.2 Ht.	...	25.8 Pt.	1.9
October	1st	38.0 Pt.	...	...	...	238.5 (7)	...	191.5
	2nd	...	181.0 Ht.	...	...	...	...	...
November	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
December	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
Total		*407.7*	*398.0*	*396.7*	*393.7*	*335.5*	*307.2*	*378.6*

(6) 35.8 Pw., 14.3 Hw.

(7) 122.1 Ht., 116.4 Th.

(8) 34.9 Pw., 11.2 Hw.

TABLE 20. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

226 farms, Wutai Hsien, Shansi, China (1922)

Months	First or second half	Irish potatoes	Foxtail millet	Kaoliang	Oats	Wheat	Other crops
February	1st	11.6 F.	...	...	...	...	...
	2nd	95.8 F.	...	...	...	71.6 F.	5.9
March	1st	...	...	48.2 Pw.	31.2 Pt.	46.5 (11)	4.8
	2nd	...	...	6.6 F.	3.7 Pt.	48.3 Pt.	4.1
April	1st	...	...	38.2 F.	...	7.2 Pt.	1.4
	2nd	...	50.2 Pw.	6.6 F.	...	...	45.2
May	1st	251.2 Pt.	54.5 (2)	47.3 Pt.	145.9 Ct.	...	49.9
	2nd	...	5.0 Pt.	...	...	...	4.4
June	1st	146.6 Ct.	49.6 (3)	162.8 Ct.	...	...	47.7
	2nd	14.5 Ct.	76.8 Ct.	...	...	21.5 Ht.	70.7
July	1st	...	83.0 Ct.	...	101.2 Ht.	96.7 Ht.	82.4
	2nd	...	...	...	41.2 (7)	223.8 (12)	18.5
August	1st	331.0 (1)	...	...	33.1 (8)	114.6 (13)	9.5
	2nd	18.9 Hw.	...	...	5.6 (9)	16.1 (14)	1.3
September	1st	4.4 Hw.	145.0 Ht.	146.2 Ht.	19.4 (10)	12.5 Th.	134.1
	2nd	...	63.8 (4)	67.3 (6)	50.0 Th.	...	58.6
October	1st	...	303.0 (5)	249.2 Th.	251.0 Th.	...	276.9
	2nd	...	17.4 Th.	...	...	...	15.6
Total		*874.0*	*848.3*	*772.4*	*682.3*	*658.8*	*831.0*

(1) 71.2 Pw., 259.8 Ht.
(2) 1.3 Pw., 53.2 F.
(3) 27.3 Pt., 22.3 Ct.
(4) 50.2 Pw., 9.9 Hw., 3.7 Ht.
(5) 8.2 Ht., 294.8 Th.
(6) 49.9 Pw., 17.4 Hw.
(7) 28.7 Pw., 12.5 Ht.
(8) 13.7 Pw., 8.1 Hw., 11.3 Ht.
(9) 1.2 Pw., 4.4 Hw.
(10) 0.6 Hw., 18.8 Th.
(11) 25.0 Hw., 17.9 F., 3.6 Pt.
(12) 19.7 Pw., 21.5 Ht., 182.6 Th.
(13) 21.5 Pw., 93.1 Th.
(14) 3.6 Pw., 12.5 Hw.

TABLE 21. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

161 farms, Lienkiang Hsien, Fukien, China (1923)

Months	First or second half	Early and late rice	Sweet potatoes	Other crops
January	1st	...	18.7 Pw.	2.6
	2nd	...	18.7 Pw.	2.6
February	1st	28.0 Pw.	...	16.8
	2nd	18.7 Pw.	...	11.2
March	1st	297.0 (1)	...	178.4
	2nd	177.4 (2)	...	106.6
April	1st	74.7 Pt.	18.7 Pw.	47.5
	2nd	158.8 Ct.	201.7 (13)	123.8
May	1st	56.0 Ct.	280.2 (14)	73.1
	2nd	201.7 (3)	233.5 (15)	154.0
June	1st	289.5 (4)	121.4 (16)	191.0
	2nd	149.4 (5)	74.7 (17)	100.3
July	1st	112.1 (6)	93.4 Ct.	80.5
	2nd	65.4 (7)	18.7 Ct.	41.9
August	1st	...	84.0 Ct.	11.8
	2nd	...	37.3 Ct.	5.3
September	1st	140.1 (8)	56.0 Ct.	92.0
	2nd	56.0 (9)	18.7 Ct.	36.3
October	1st	37.4 (10)	65.4 (18)	31.6
	2nd	196.1 (11)	168.1 Ht.	141.5
November	1st	56.0 (12)	102.7 Ht.	48.4
	2nd	46.7 Pw.	56.0 Ht.	35.9
December	1st	177.5 Pw.	...	106.6
	2nd	...	...	...
Total		*2338.5*	*1667.9*	*1639.7*

(1) 37.4 Pw., 138.1 Hw., 121.5 F.
(2) 18.6 Hw., 158.8 Pt.
(3) 74.6 Ct., 93.4 Ht., 33.7 Th.
(4) 18.8 Ct., 177.5 Ht., 93.2 Th.
(5) 37.4 Ct., 74.7 Ht., 37.3 Th.
(6) 18.7 Hw., 93.4 Ct.
(7) 37.3 Hw., 28.1 F.
(8) 18.6 F., 84.1 Ht., 37.4 Th.
(9) 37.4 Ht., 18.6 Th.
(10) 28.1 Ht., 9.3 Th.
(11) 121.4 Ht., 74.7 Th.
(12) 37.4 Ht., 18.6 Th.
(13) 43.0 Pw., 46.6 Hw., 18.7 F., 93.4 Ct.
(14) 46.8 Pw., 93.3 Hw., 18.8 F., 121.3 Pt.
(15) 56.0 Hw., 9.4 F., 168.1 Pt.
(16) 65.3 Pt., 56.1 Ct.
(17) 18.7 F., 56.0 Ct.
(18) 28.1 Ct., 37.3 Ht.

more sweet potatoes and vegetables. If wheat or barley acreage is reduced, more cotton and hemp might be grown. These are all possibilities for making a better distribution of labor.

Su Hsien, Anhwei

The distribution of man labor in Su Hsien is better than in some of the other localities because of the great diversification of crops. However, there is a peak of labor the first half of June which, if it were not for the additional labor hired at that time, would amount to over 16 hours of work per day for the 1.75 man-equivalent, regardless of weather conditions. The accumulation of labor at this time is for the crops of wheat, wheat and field peas, and field peas, and barley all of which ripen at practically the same time. One way to reduce the work at this period is to use quicker methods of harvesting

TABLE 22. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

217 farms, Kiangning (T) Hsien, Kiangsu, China (1924)

Months	First or second half	Vegetables	Taro	Water-melons and cowpeas	Winter radish	Cotton	Glutinous rice	Sweet potatoes
January	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	10.7	...	...
February	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	21.6	...	...
March	1st	...	...	...	...	...	...	...
	2nd	...	...	49.4	...	...	...	11.6
April	1st	...	...	180.1	...	...	...	10.5
	2nd	3276.5 (1)	...	341.8 Pt.	...	188.2 Pt.	...	...
May	1st	4242.7 (2)	2030.0 Pt.	508.1	...	256.3	...	...
	2nd	5043.4 (3)	1620.0	954.4	...	430.2	33.2	...
June	1st	2935.7 (4)	1320.0	1057.5	...	356.1	486.0 Pt.	
	2nd	2032.4 (5)	2040.0	1735.2	...	178.1	568.6	416.6 Pt.
July	1st	1847.7 (6)	1150.0	1554.6 Ht.	...	...	573.8	329.3
	2nd	615.9 (7)	800.0	1766.4 Ht.	...	...	366.7	174.3
August	1st	...	750.0	1391.3 Ht.	...	...	21.6	145.3
	2nd	...	...	406.4 Ht.	315.0 Pt.	94.4 Ht.	4.3	106.5
September	1st	...	230.0 Ht.	218.9 Ht.	607.5 Pt.	242.8 Ht.	13.0	106.5
	2nd	3914.2 (8)	750.0 Ht.	265.7 Ht.	612.5	323.7 Ht.	64.7 Ht.	77.5
October	1st	3832.1 (9)	480.0 Ht.	109.4 Ht.	656.7	256.3 Ht.	159.6 Ht.	38.8
	2nd	3941.6 (10)	...	...	527.5	279.3 Ht.	3.9	...
November	1st	3175.2 (11)	...	...	125.9	...	...	...
	2nd	2354.0 (12)	...	...	154.2 Ht.	...	...	278.9 Ht.
December	1st	...	...	...	133.3 Ht.	...	...	...
	2nd	...	...	...	329.2 Ht.	...	...	...
Total		*37211.4*	*11170.0*	*10539.2*	*3461.8*	*2637.7*	*2295.4*	*1695.8*

(1) 308.0 Pw., 370.2 F., 429.2 Pt., 1848.0 It., 321.1 M.
(2) 1917.7 F., 2325.0 It.
(3) 2259.4 F., 2708.3 It., 75.7 M.
(4) 452.1 F., 2107.8 It., 375.8 M.
(5) 1205.2 It., 827.2 M.
(6) 1095.7 It., 752.0 M.
(7) 273.5 It., 342.4 M.
(8) 344.5 Pw., 274.0 F., 477.5 Pt., 2462.0 It., 356.2 M.
(9) 1644.0 F., 2188.1 It.
(10) 1970.8 F., 1970.8 It.
(11) 1422.5 F., 1752.7 It.
(12) 218.9 F., 767.4 It., 273.1 Ht., 1094.6 M.

TABLE 22.—*(Continued)*

Months	First or second half	Rice	Sesame and green beans	Corn and soybeans	Sesame and soybeans	Sesame	Wheat
January	1st	...	...	...	...	...	49.8 F.
	2nd	...	...	...	...	...	8.3 F.
February	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	...
March	1st	...	...	...	...	...	77.2 Ct.
	2nd	...	42.0	...	...	22.2	83.1 Ct.
April	1st	...	...	...	...	...	15.9 Ct.
	2nd	...	...	...	...	50.1	...
May	1st	...	...	...	...	...	...
	2nd	199.0 (13)	52.0 Pt.	...	...	165.3 Pt.	41.1 (21)
June	1st	213.3 (14)	130.0 Pt.	97.4 Pt.	89.2 Pt.	143.8 Pt.	314.0 (22)
	2nd	277.1 (15)	195.0	275.1	201.3	191.3	...
July	1st	283.8 (16)	170.7	336.1	200.4	139.1	...
	2nd	159.5 (17)	65.6	19.5	122.0	27.8	...
August	1st	22.8 (18)	...	...	...	...	...
	2nd	4.6 M.	...	...	...	...	...
September	1st	185.5 (19)	31.5 Ht.	131.9 Ht.	...	139.1 Ht.	...
	2nd	95.7 (20)	156.3 Ht.	...	83.7 Ht.	27.8 Ht.	...
October	1st	1.3 M.	164.1 Ht.	109.4 Ht.	83.7 Ht.	...	59.7 (23)
	2nd	...	100.4 Ht.	97.3 Ht.	141.1 Ht.	...	131.3 (24)
November	1st	...	...	31.9	...	...	...
	2nd	12.4 F.	...	...	...	...	...
December	1st	...	...	...	...	...	6.6 F.
	2nd	...	...	...	...	...	32.4 F.
Total		*1455.0*	*1107.6*	*1098.6*	*921.4*	*906.5*	*819.4*

(13) 32.2 Pw., 11.6 Hw., 4.4 F., 98.7 Pt., 38.6 It., 13.5 M.
(14) 7.9 Pw., 3.6 Hw., 4.2 F., 30.1 Pt., 68.7 It., 80.2 Ct., 18.6 M.
(15) 3.6 F., 147.4 It., 118.9 Ct., 7.2 M.
(16) 173.1 It., 100.2 Ct., 10.5 M.
(17) 131.6 It., 18.2 Ct., 9.7 M.
(18) 16.9 It., 5.9 M.
(19) 109.3 Ht., 56.0 Th., 20.2 M.
(20) 54.6 Ht., 30.0 Th., 11.1 M.
(21) 36.5 Ht., 4.6 M.
(22) 129.0 Ht., 138.2 Th., 46.8 M.
(23) 10.4 Pw., 41.5 Hw., 2.6 Pt., 5.2 M.
(24) 21.9 Pw., 92.6 Hw., 6.0 Pt., 10.8 M.

TABLE 22.—*(Continued)*

Months	First or second half	Barley	Soy beans	Broad beans	Corn	Field peas	Other crops
January	1st	48.7 F.	...	30.9	...	36.0	...
	2nd	11.0 F.	...	19.3	...	36.0	...
February	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	...
March	1st	116.3 Ct.	...	75.3	...	65.6	...
	2nd	132.0 Ct.	...	88.8	...	77.2	43.4
April	1st	...	...	8.7	...	...	62.8
	2nd	...	...	...	...	...	135.8
May	1st	...	...	...	...	...	195.1
	2nd	183.7 (25)	...	58.4 Ht.	...	...	397.9
June	1st	109.1 (26)	153.7 (30)	218.1 Ht.	72.1 Pt.	153.2 Ht.	472.4
	2nd	21.6 (27)	146.5 (31)	...	105.2	...	738.3
July	1st	...	160.0 Ct.	...	232.3	...	699.5
	2nd	...	67.6 Ct.	...	...	...	713.7
August	1st	...	...	...	...	...	536.3
	2nd	...	...	...	...	...	164.4
September	1st	...	...	...	...	...	99.5
	2nd	...	...	...	191.3 Ht.	...	198.8
October	1st	52.9 (28)	145.4 (32)	9.6	30.8	...	144.8
	2nd	80.5 (29)	106.5 (33)	155.8 Pt.	...	73.8 Pt.	62.8
November	1st	...	...	...	...	...	...
	2nd	9.4 F.	...	...	...	...	...
December	1st	6.3 F.	...	23.1	...	38.6	...
	2nd	25.1 F.	...	54.0	...	59.2	...
Total		*796.6*	*779.7*	*742.0*	*631.7*	*539.6*	*4664.9*

(25) 153.4 Ht., 6.4 Th., 23.9 M.
(26) 88.6 Th., 20.5 M.
(27) 17.3 Th., 4.3 M.
(28) 12.8 Pw., 19.7 Hw., 6.7 Pt., 13.7 M.
(29) 20.9 Pw., 33.0 Hw., 10.5 Pt., 16.1 M.
(30) 50.9 Pw., 17.3 Hw., 30.9 Pt., 54.6 M.
(31) 5.0 F., 141.5 Ct.
(32) 94.6 Ht., 24.9 Th., 25.9 M.
(33) 36.5 Ht., 58.8 Th., 11.2 M.

TABLE 23. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER HECTARE FOR EACH CROP

300 farms, Wuchin Hsien, Kiangsu (1924)

Months	First or second half	Vegetables	Taro	Sesame and red beans	Rapeseed	Watermelons and soybeans	Glutinous rice	Early rice	Arrow-head
January	1st	...	...	...	115.1	...	...	...	19.7 Ht.
	2nd	...	...	...	40.5	...	...	...	65.4 Ht.
February ..	1st	...	...	...	70.4	...	...	...	...
	2nd	...	...	...	164.1	...	...	...	...
March	1st	...	...	...	17.1	...	...	...	...
	2nd	...	...	...	105.7 Ht.	108.8	...	...	...
April	1st	...	584.5 Pt.	...	88.7 Ht.	63.0 Pt.	...	...	...
	2nd	...	...	...	...	102.4 Pt.	...	...	...
May	1st	...	...	34.3 Pt.	...	346.8 Pt.	...	27.1 (1)	...
	2nd	...	163.3	201.4 Pt.	...	168.7	...	...	...
June	1st	...	150.5	14.3 Pt.	...	72.5	...	56.1 (2)	...
	2nd	...	171.9	64.3 Pt.	...	107.2	205.3 Pt.	175.5 (3)	235.3 Pt.
July	1st	...	85.9	187.1 Pt.	...	127.7 Ht.	230.1	175.9 (4)	189.5 Pt.
	2nd	...	214.9	221.4	...	99.3 Ht.	200.4	123.1 (5)	202.5
August	1st	865.7 Pt.	...	48.6	...	25.2 Ht.	61.8	49.6 (6)	111.2
	2nd	541.1	...	...	...	...	44.5	20.6 It.	6.6
September ..	1st	380.8	...	...	...	...	47.0	14.7 It.	...
	2nd	...	47.3 Ht.	392.8 Ht.	...	...	19.8	13.3 It.	...
October	1st	80.2 Ht.	90.2 Ht.	48.6 Ht.	212.3 Pt.	11.0 Ht.	51.9 Ht.	219.9 (7)	...
	2nd	144.3 Ht.	111.8 Ht.	442.9 Ht.	327.4 Pt.	154.4 Ht.	160.8 Ht.	20.6 (8)	...
November ..	1st	...	64.4 Ht.	...	140.6	...	...	...	...
	2nd	...	...	...	46.1	...	...	...	...
December ..	1st	...	...	...	63.9	...	...	...	...
	2nd	...	...	...	100.1	...	...	...	65.4 Ht.
Total		*2012.1*	*1684.7*	*1655.7*	*1492.0*	*1387.0*	*1021.6*	*896.4*	*895.6*

(1) 12.1 Pt., 15.0 M.
(2) 26.7 Pw., 7.0 F., 22.4 M.
(3) 30.4 Hw., 9.8 F., 110.6 Pt., 24.7 It.
(4) 1.9 F., 28.5 It., 145.5 Ct.
(5) 38.4 It., 84.7 Ct.
(6) 19.2 It., 30.4 Ct.
(7) 9.2 Pp., 108.6 Ht., 53.9 Th., 48.2 M.
(8) 0.9 Pp., 11.2 Ht., 4.7 Th., 3.8 M.

TABLE 23.—*(Continued)*

Months	First or second half	Broad beans	Late rice	Sesame	Soybeans	Barley	Field peas	Wheat	Wheat and field peas	Green manure
January	1st	31.9	...	...	...	19.7	33.9	16.6 (16)	15.9	...
	2nd	8.2	...	...	...	41.5	8.9	44.7 (17)	25.4	...
February ..	1st	32.8	...	...	...	0.4	8.9	14.4 (18)	71.6	...
	2nd	33.6	...	...	...	54.0	8.9	28.6 (19)	23.9	...
March	1st	2.5	...	...	...	7.6	...	20.1 (20)	...	...
	2nd	3.3	...	...	...	2.2	...	4.1 (21)	...	...
April	1st	...	...	...	...	...	...	1.7 Pp.	...	...
	2nd	...	...	...	...	...	...	0.4 Pp.	...	...
May	1st	...	17.5 (9)	...	...	...	...	...	...	89.0 Ht.
	2nd	29.5 Ht.	...	150.0 Pt.	...	152.9 Ht.	102.5 Ht.	...	...	31.2 Ht.
June	1st	276.8 Ht.	85.8 (10)	...	30.6 Pt.	...	98.0 Ht.	99.6 (22)	116.1 Ht.	...
	2nd	9.8 Ht.	123.7 (11)	118.4	185.9 Pt.	...	...	...	...	...
July	1st	...	151.8 (12)	23.7	27.8	...	...	...	...	...
	2nd	...	126.6 (13)	110.6	77.8	...	...	...	...	...
August	1st	...	52.5 (14)	15.7	111.0	...	...	...	...	...
	2nd	...	16.9 It.	...	...	...	...	...	...	...
September ..	1st	...	13.2 It.	268.4 Ht.	...	...	...	...	...	...
	2nd	...	11.2 It.	...	...	...	...	...	...	...
October	1st	227.8 Pt.	9.2 It.	...	...	115.8 Pt.	114.9 Pt.	8.3 (23)	32.2 Pt.	210.4 Pt.
	2nd	126.3 Pt.	199.5 (15)	...	216.5 Ht.	78.4 Pt.	88.2 Pt.	110.6 (24)	56.9 Pt.	35.8 Pt.
November ..	1st	3.3	...	...	...	0.9	...	13.0 (25)	23.9	2.2
	2nd	26.5	...	...	...	24.5	22.3	4.1 Pp.	...	...
December ..	1st	...	...	...	...	20.5	...	12.9 (26)	23.9	...
	2nd	72.9	...	...	...	74.3	...	66.9 (27)	55.6	...
Total		*885.2*	*807.9*	*686.8*	*649.6*	*592.7*	*486.5*	*446.0*	*445.4*	*368.6*

(9) 7.5 Pw., 10.0 M.
(10) 22.6 Pw., 33.9 Hw., 14.1 F., 15.2 M.
(11) 2.3 F., 103.3 Pt., 18.1 It.
(12) 24.1 It., 127.7 Ct.
(13) 31.0 It., 95.6 Ct.
(14) 22.1 It., 30.4 Ct.
(15) 9.6 Pp., 106.1 Ht., 55.1 Th., 28.7 M.
(16) 0.9 Pp., 15.7 Ct.
(17) 1.8 F., 1.7 Pp., 41.2 Ct.
(18) 3.1 F., 1.7 Pp., 9.6 Ct.
(19) 1.7 F., 1.1 Pp., 25.8 Ct.
(20) 0.9 F., 0.9 Pp., 18.3 Ct.
(21) 1.5 Pp., 2.6 Ct.
(22) 42.9 Ht., 37.5 Th., 19.2 M.
(23) 1.5 Pw., 1.8 Hw., 0.8 Pt., 4.2 M.
(24) 22.6 Pw., 25.4 Hw., 1.3 F., 11.3 Pt., 50.0 M.
(25) 1.2 Pw., 1.3 Hw., 7.4 F., 0.6 Pt., 2.5 M.
(26) 5.5 F., 0.9 Pp., 6.5 Ct.
(27) 1.3 F., 1.8 Pp., 63.8 Ct.

and threshing. The reaper and the thresher might possibly prove economical in this respect. Another solution of the difficulty is to plant non-competing crops, such as Irish and sweet potatoes, hemp and cotton. Such crops as these are more adapted to the use of animal-drawn cultivators and would also make a better distribution of animal labor.

Yenshan Hsien (1922), Chihli

One of the suggestions made for this locality at the time the data were published (1) was that sweet potatoes be introduced to distribute labor better and to maintain or increase the food supply. Since publication, it has been learned from the investigator for this locality that sweet potatoes, which at that time were only beginning to be grown by a few farmers, are now being increasingly grown. The cropping system of the locality at the time of the study was particularly bad in that no tuber, fiber, or fruit crops were grown, thus making the farm business very undiversified.

Pingsiang Hsien, Chihli

The best distribution of man labor for any of the localities is at Pingsiang, because of the growing of vegetables. In other words, an intensive crop, such as vegetables, provides a greater amount of labor per farm and at a time when this labor supplements rather than interferes with other crops.

Sincheng Hsien, Honan

The growing of the competing crops of late millet and corn are responsible for the peak of labor the first half of September at Sincheng. Millet also provides no work during the months of July and August. Both sweet potatoes and cotton would give a better labor distribution and would provide for more late autumn work. However, the peak of labor is not serious, as it comes during the year when weather usually permits work every day and it does not amount to more than about nine hours of work per day for all the man-equivalents.

Wutai Hsien, Shansi

The one-crop-a-year system at Wutai gives a very high peak, but even so the available amount of labor can easily

take care of this rush season. However, it does mean that there is insufficient work during the other periods of the growing season because of the limited acreage of such frequently cultivated crops as kaoliang and Irish potatoes.

Lienkiang Hsien, Fukien

At Lienkiang the two crops of early and late rice and the crop of sweet potatoes provide work enough to keep the available farm labor very busy for several periods of the growing season and in the latter part of May and June labor must be hired. The distribution is not good, although in certain ways better than in North China, because work begins earlier in the spring and ends later in the autumn.

Kiangning Hsien (T), Kiangsu

The periods of almost no work in April and the first part of May and in August and the very high peak of labor the first half of June make for a rather poor labor distribution on the farms in Kiangning, two and three miles outside the Taiping Gate of Nanking. Much of the hill land of this section is adapted to the growing of sweet potatoes, peanuts, and fruits, and if such crops were grown, farming would be diversified, labor better distributed, and probably profits increased. This also holds true for the other section of Kiangning Hsien (S) studied, about 20 kilometers southeast of Nanking, where sweet potatoes recently have become a part of the cropping system.

SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR

The semi-monthly distribution of animal labor by important and by minor crops is given for the total of such labor for nine typical localities in tables 24-32 and figs. 14-22. Total man labor for other localities is shown in figs. 23 and 24. The distribution is much more uneven than for man labor because of the larger amount of time when there is no work performed. Here, as with man labor, there are times when there is too much labor to be done and at other times too little. Take, for instance, plowing for wheat at Su Hsien, Anhwei. There is so much plowing to be done that if the year is dry, as frequently is the case, much of it cannot be accomplished before it is too

TABLE 24. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

124 farms, Hwaiyuan Hsien, Anhwei, China

Months	First or second half	Rice	Wheat	Kaoliang	Barley	Wheat and field peas	Sesame	Sweet potatoes	Soybeans	Cotton	Green beans	Millet	Hemp	Sesame and small beans	Peanuts	Sesame and Soybeans	Indigo	Musk-melons	Water-melons	Carrots	Other crops	Total hours
January	1st	706	...	...	...	...	...	...	...	92	...	...	79	...	16	...	...	...	...	...	...	893
	2nd	794	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	794
February	1st	1691	...	...	...	...	...	...	...	...	...	...	44	...	...	...	...	...	...	...	...	1735
	2nd	764	...	...	...	...	...	...	...	285	...	...	...	...	...	...	...	...	3	...	...	1052
March	1st	4063	...	...	...	256	...	...	...	104	...	...	...	...	...	...	...	26	3	...	...	4452
	2nd	265	...	3954	...	213	...	...	...	374	...	...	40	...	26	...	20	...	5	...	...	4897
April	1st	4115	...	...	...	...	...	...	...	631	...	...	59	...	...	...	24	33	1	...	...	4863
	2nd	456	...	4537	...	...	...	...	...	741	...	391	112	...	194	...	33	...	...	...	5	6469
May	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	...	2018	...	1178	...	525	...	...	...	...	...	...	35	...	108	58	27	...	...	...	3949
June	1st	2605	5065	...	...	811	2804	1921	2246	...	...	...	...	215	...	85	9	...	...	...	...	15761
	2nd	9239	410	...	...	341	382	286	...	...	99	...	...	...	...	...	26	...	...	...	2	10785
July	1st	...	252	...	...	...	...	...	...	...	594	...	...	...	...	...	...	...	...	...	11	857
	2nd	...	...	...	...	...	...	...	...	...	396	...	...	...	...	...	...	...	...	5	8	409
August	1st	...	...	1579	144	313	...	...	...	...	...	269	...	...	...	...	...	...	...	3	3	2311
	2nd	...	...	...	287	939	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1226
September	1st	2429	...	500	1045	284	498	...	...	...	...	...	...	69	...	...	...	...	...	...	...	4825
	2nd	507	6974	...	705	995	...	...	404	...	...	...	...	...	...	83	...	...	...	...	...	9668
October	1st	1970	8008	...	1384	1593	...	667	...	...	227	...	...	...	...	...	...	...	...	...	4	13853
	2nd	...	3151	4149	1933	569	...	695	...	...	179	...	...	...	79	...	...	...	...	...	3	10758
November	1st	...	...	...	470	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	470
	2nd	941	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	944
December	1st	...	...	...	...	...	...	...	...	46	...	65	...	...	...	...	...	4	...	...	1	116
	2nd	...	...	...	...	...	...	...	...	277	...	215	...	...	...	...	26	7	3	...	3	531
Total		*30545*	*25878*	*14719*	*7146*	*6314*	*4209*	*3569*	*2650*	*2550*	*1495*	*940*	*334*	*319*	*315*	*276*	*196*	*97*	*18*	*8*	*40*	*101613*
Percentage		*30.1*	*25.5*	*14.5*	*7.0*	*6.2*	*4.2*	*3.5*	*2.6*	*2.5*	*1.5*	*0.9*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.1*	—	—	—	*100.0*

TABLE 25. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

286 farms, Su Hsien, Anhwei, China (1924)

Months	First or second half	Wheat	Kao-liang	Barley	Wheat and field peas	Field peas	Soy-beans	Millet	Sesame	Green beans	Cotton	Hemp	Pea-nuts	Other crops	Total hours
February	1st	...	3764	...	...	...	...	376	504	...	787	161	26	109	5727
	2nd	...	2085	...	...	...	...	914	630	...	866	66	78	156	4795
March	1st	...	9663	...	...	...	...	1613	95	...	79	397	42	35	11924
	2nd	...	8850	...	...	...	...	1147	599	...	...	245	287	23	11151
April	1st	...	5493	...	...	...	...	...	95	...	236	236	94	1005	7159
	2nd	...	...	...	...	...	...	591	158	...	453	...	57	4437	5696
May	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	1095	...	...	...	...	722	...	...	...	...	...	41	47	1905
June	1st	8213	...	8097	6384	7929	4100	...	390	94	...	...	35	367	35609
	2nd	2434	...	...	...	...	...	...	1064	1404	...	...	...	25	4927
July	1st	...	...	...	...	...	...	...	...	...	...	202	...	57	259
	2nd	730	...	802	...	...	...	645	...	94	...	372	...	229	2872
August	1st	12472	12473	601	...	...	...	323	426	1076	...	...	...	120	27491
	2nd	21294	...	1102	...	...	...	...	355	2153	...	...	...	305	25209
September	1st	23302	...	5131	2638	...	4001	...	390	187	...	...	...	343	35992
	2nd	2860	...	14371	9075	...	6477	...	...	...	...	...	...	1584	34367
October	1st	1460	...	6664	10183	12211	...	...	...	...	465	...	47	2236	33266
	2nd	...	8341	501	2439	4983	...	2079	630	...	236	208	475	176	20068
November	1st	...	7120	...	...	...	...	681	...	...	630	208	115	142	8896
	2nd	...	305	...	...	...	...	...	...	...	315	...	21	49	690
December	1st	...	916	...	...	...	...	968	...	...	...	28	104	54	2070
	2nd	...	13936	...	...	...	...	1183	1135	...	472	283	73	77	17159
Total		*73860*	*72946*	*37269*	*30719*	*25123*	*15300*	*10520*	*6471*	*5008*	*4539*	*2406*	*1495*	*11576*	*297232*
Percentage		*24.9*	*24.6*	*12.6*	*10.3*	*8.5*	*5.2*	*3.5*	*2.2*	*1.7*	*1.5*	*0.8*	*0.5*	*3.7*	*100.0*

TABLE 26. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

152 farms, Pingsiang Hsien, Chihli, China (1923)

Months	First or second half	Wheat	Millet	Kaoliang	Vegetables	Hemp	Soy beans	Other crops	Total hours
March	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	13	13
April	1st	311	...	...	...	...	...	2961	3272
	2nd	311	1826	1863	...	349	84	3	4436
May	1st	...	...	...	...	88	...	16	104
	2nd	332	...	...	...	59	...	60	451
June	1st	1366	986	...	...	32	...	73	2457
	2nd	1691	79	...	410	...	...	48	2228
July	1st	1025	...	...	341	110	...	58	1534
	2nd	1344	736	...	235	...	...	56	2371
August	1st	755	1114	36	...	...	...	943	2848
	2nd	1624	607	135	...	...	39	104	2509
September	1st	77	1332	154	...	...	...	1923	3486
	2nd	...	502	1021	...	75	61	...	1659
October	1st	...	...	...	304	...	...	14	318
	2nd	319	...	...	...	...	...	...	319
Total		*9155*	*7182*	*3209*	*1290*	*713*	*184*	*6272*	*28005*
Percentage		*32.7*	*25.6*	*11.5*	*4.6*	*2.6*	*0.6*	*22.4*	*100.0*

TABLE 27. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

133 farms, Yenshan Hsien, Chihli, China (1923)

Months	First or second half	Kaoliang	Wheat	Millet	Corn	Other crops	Total hours
February	1st	...	...	...	...	...	...
	2nd	666	...	228	...	28	922
March	1st	2894	...	1043	...	125	4062
	2nd	5491	...	2340	...	268	8099
April	1st	3357	...	1314	...	154	4825
	2nd	1041	...	1998	...	180	3219
June	1st	...	3519	...	...	7	3526
	2nd	156	4659	...	2878	6239	13932
July	1st	1041	216	380	2275	1116	5028
	2nd	1510	1573	1330	...	134	4547
August	1st	...	...	586	91	91	768
	2nd	4143	2082	2237	205	341	9008
September	1st	2842	13831	1168	346	326	18513
	2nd	...	4597	...	1647	784	7028
October	1st	...	212	...	182	3709	4103
	2nd	2228	...	...	...	832	3060
November	1st	5538	...	2415	...	275	8228
	2nd	...	...	695	...	57	752
December	1st	...	...	261	...	22	283
	2nd	...	...	...	...	...	...
Total		*30907*	*30639*	*15995*	*7624*	*14638*	*99903*
Percentage		*31.0*	*30.7*	*16.0*	*7.6*	*14.7*	*100.0*

dry. Poor farmers depend on borrowing animals from relatives or neighbors, and since the animals are not enough to get the work done in the proper season, planting is often delayed because the soil has dried out before it could be plowed and harrowed and the moisture thus conserved.

TABLE 28. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

144 farms, Sincheng Hsien, Honan, China (1923)

Months	First or second half	Wheat	Kaoliang	Barley	Corn	Sweet potatoes	Buckwheat	Late millet	Sesame	Early millet	Seed melons	Black soybeans	Green beans	Sesame & green beans	Millet and green beans	Other crops	Total hours
March	1st	...	8601	...	...	...	...	...	...	...	...	...	...	...	...	...	8601
	2nd	...	4257	...	...	...	...	...	...	...	...	...	...	...	...	...	4257
April	1st	...	10288	...	...	...	...	...	...	1985	2400	...	...	...	...	302	14975
	2nd	...	1099	...	...	...	...	...	2820	...	1439	...	...	...	...	181	5539
May	1st	...	...	...	...	6467	...	...	...	310	259	...	...	...	...	33	7069
	2nd	2632	...	783	...	3302	...	...	3560	1593	...	...	...	...	...	14	23444
June	1st	7126	...	1506	10560	...	...	1605	...	...	...	906	441	35	8	207	15426
	2nd	...	...	...	3592	...	...	...	...	...	...	...	...	...	...	...	...
July	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	2653	...	...	...	...	...	...	...	...	...	2653
August	1st	...	4659	...	...	...	3225	...	...	...	...	...	...	...	...	...	7884
	2nd	29141	...	...	...	...	...	...	183	...	...	...	...	...	...	110	29434
September	1st	26423	...	8514	...	...	...	5039	...	637	...	...	478	...	19	100	41210
	2nd	4928	...	4331	...	...	...	...	...	...	...	...	399	60	...	19	9737
October	1st	...	...	1078	...	...	...	...	...	...	...	3181	...	...	...	634	4893
	2nd	...	...	...	...	...	868	...	...	...	...	...	...	...	...	...	868
November	1st	...	...	...	...	989	...	...	...	...	...	...	...	...	...	...	989
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total		*71250*	*28904*	*16212*	*14152*	*10758*	*6746*	*6644*	*6563*	*4525*	*4098*	*4087*	*1318*	*95*	*27*	*1600*	*176979*
Percentage		*40.3*	*16.3*	*9.2*	*8.0*	*6.1*	*3.8*	*3.7*	*3.7*	*2.6*	*2.3*	*2.3*	*0.7*	*0.1*	—	*0.9*	*100.0*

TABLE 29. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

226 farms, Wutai Hsien, Shansi, China (1922)

MONTHS	First or second half	Foxtail millet	Kao-liang	Oats	Irish potatoes	Wheat	Other crops	Total hours
February	1st	...	...	...	1858	...	...	1858
	2nd	...	...	...	15561	8304	2109	25974
March	1st	...	22063	18906	...	7513	2599	51081
	2nd	...	3309	1929	...	5536	1508	12282
April	1st	...	16179	...	...	396	599	17174
	2nd	23343	2942	...	...	...	30720	57005
May	1st	26225	10112	...	8361	...	34723	79421
	2nd	1441	...	...	...	...	1891	3332
June	1st	6628	...	...	...	...	8697	15325
	2nd	...	...	...	...	...	...	...
July	1st	...	...	5016	...	593	151	5760
	2nd	...	...	19292	...	5141	1306	25739
August	1st	...	...	12347	11381	4350	1105	29183
	2nd	...	...	3087	1510	1779	452	6828
September	1st	7925	2942	1929	349	1384	10841	25370
	2nd	26081	26291	...	...	...	35033	87405
October	1st	2306	...	...	...	...	3025	5331
	2nd	...	...	...	...	...	...	...
Total		*93949*	*83838*	*60506*	*39020*	*34996*	*134759*	*449068*
Percentage		*20.9*	*18.7*	*13.9*	*8.7*	*7.8*	*30.0*	*100.0*

TABLE 30. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

161 farms, Lienkiang Hsien, Fukien, China (1923)

MONTHS	First or second half	Late and early rice	Sweet potatoes	Other crops	Total hours
January	1st	...	1164	60	1224
	2nd	...	1164	60	1224
February	1st	2776	...	381	3157
	2nd	1850	...	254	2104
March	1st	19245	...	2642	21887
	2nd	1851	...	254	2105
April	1st	...	1164	60	1224
	2nd	...	5587	286	5873
May	1st	...	4074	209	4283
	2nd	...	4074	209	4283
November	1st	...	...	...	...
	2nd	4626	...	635	5261
December	1st	17580	...	2413	19993
	2nd	...	...	...	...
Total		*47928*	*17227*	*7463*	*72618*
Percentage		*66.0*	*23.7*	*10.3*	*100.0*

TABLE 31. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

217 farms, Kiangning (T) Hsien, Kiangsu, China (1924)

Months	First or second half	Rice	Wheat	Soybeans	Barley	Corn and soybeans	Field peas	Broad beans	Glutinous rice	Corn	Sweet potatoes	Sesame & green beans	Sesame	Water-melons and cow peas	Sesame and yellow soybeans	Cotton	Winter radish	Other crops	Total hours
January	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	5
March	1st	...	...	...	...	...	...	...	...	...	...	14	...	...	...	...	...	12	26
	2nd	...	...	...	...	...	...	...	...	...	18	...	...	40	...	...	...	29	87
April	1st	...	...	...	...	...	...	...	...	...	17	...	...	10	...	...	...	9	36
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22	...	1	23
May	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	7753	...	...	...	...	...	...	57	...	...	39	49	...	...	...	...	34	7932
June	1st	2034	...	3586	...	1541	...	...	304	142	...	38	12	...	40	...	...	33	7730
	2nd	...	...	...	...	...	...	...	...	...	78	...	...	...	...	...	...	...	78
August	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	5
September	1st	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	4
	2nd	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
October	1st	...	1939	...	1303	...	...	...	...	...	...	...	...	...	...	...	...	...	3242
	2nd	...	4363	...	1955	...	953	723	...	...	...	...	...	...	...	...	...	...	7994
Total		*9787*	*6302*	*3586*	*3258*	*1541*	*935*	*723*	*361*	*142*	*113*	*91*	*61*	*50*	*40*	*27*	*9*	*118*	*27162*
Percentage		*36.0*	*23.2*	*13.2*	*12.0*	*5.7*	*3.5*	*2.7*	*1.3*	*0.5*	*0.4*	*0.4*	*0.2*	*0.2*	*0.2*	*0.1*	—	*0.4*	*100.0*

TABLE 32. SEMI-MONTHLY DISTRIBUTION OF TOTAL ANIMAL LABOR IN HOURS FOR EACH CROP

300 farms, Wuchin Hsien, Kiangsu, China (1924)

Months	First or second half	Late rice	Early rice	Wheat	Broad beans	Glutinous rice	Wheat and field peas	Barley	Field peas	Rape seed	Total hours
June	1st	4181	2460	...	...	...	...	...	...	...	6641
	2nd	9579	5093	...	...	1188	...	...	...	...	15860
July	1st	4445	2633	...	...	...	...	...	...	...	7078
	2nd	5715	3539	...	...	...	...	...	...	...	9254
August	1st	4075	1770	...	...	...	...	...	...	...	5845
	2nd	3122	1899	...	...	...	...	...	...	...	5021
September	1st	2434	1359	...	...	...	...	...	...	...	3793
	2nd	2064	1230	...	...	...	...	...	...	...	3294
October	1st	1693	...	675	1275	...	280	345	132	69	4469
	2nd	...	...	9574	648	...	534	189	96	63	11104
November	1st	...	...	501	...	...	...	...	...	...	501
	2nd	...	...	...	...	...	...	...	...	...	...
Total		*37308*	*19983*	*10750*	*1923*	*1188*	*814*	*534*	*228*	*132*	*72860*
Percentage		*51.2*	*27.4*	*14.8*	*2.7*	*1.6*	*1.1*	*0.7*	*0.3*	*0.2*	*100.0*

The problem of a good distribution of animal labor is similar to that for man labor and tables 33-41 showing distribution on a per hectare basis are useful in determing the desirable acreage for each crop. If possible and if profitable, non-competing crops should be grown. Improved implements and better animals will in some instances help to get the work done during the peak periods. A glance at the figures showing the distribution of animal labor shows that in some localities the distribution is much better than others. Comparatively speaking, the distribution is best at Su Hsien, Anhwei, and at Pingsiang Hsien, Chihli, and is very bad in Kiangning Hsien (T), Kiangsu, and Lienkiang Hsien, Fukien. Usually a better adjustment of crops for a better man labor distribution will also provide for a better animal labor distribution.

In addition to the one and often two peaks of man labor common to most localities, there is the complete or almost complete lack of work on crops or productive animals during the winter. An exception is Wutai Hsien, Shansi, where quite a number of sheep are raised, but the labor on these sheep has not been included in the chart of labor distribution for that locality. This absence of work during the winter months and parts of the growing season months limits the income from farming. Wealth is only obtained from production and if a man is not working he is not producing, and hence not gaining perhaps even a minimum standard of living.

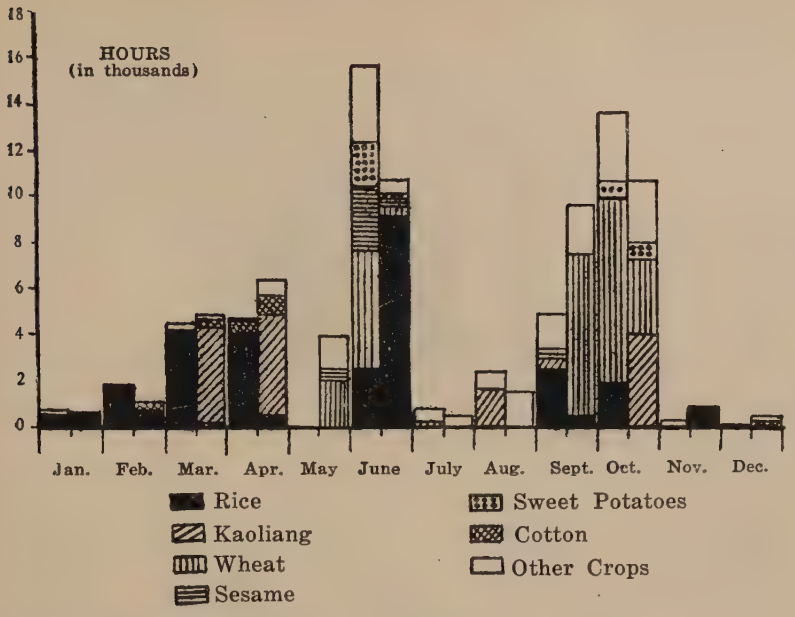

Fig. 14.—Semi-monthly distribution of total animal labor in hours for all crops 124 farms, Hwaiyuan Hsien, Anhwei, China (1924)

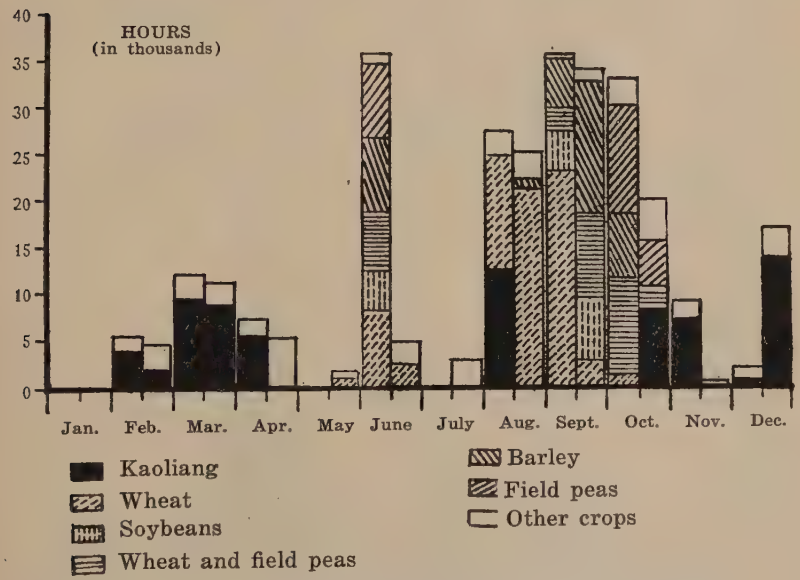

Fig. 15.—Semi-monthly distribution of total animal labor in hours for all crops. 286 farms, Su Hsien, Anhwei, China (1924)

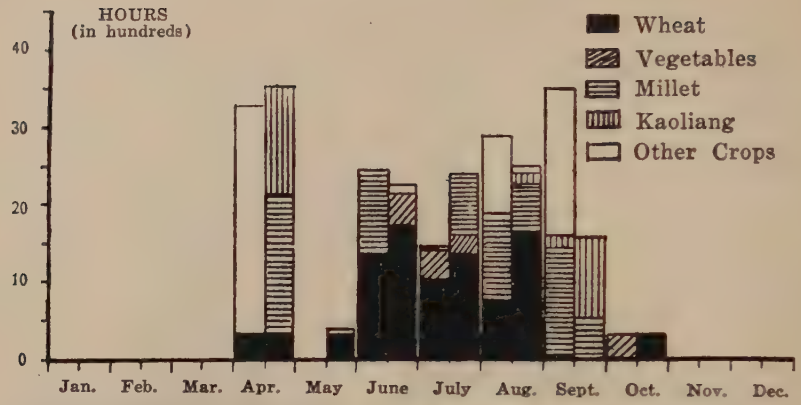

Fig. 16.—Semi-monthly distribution of animal labor in hours for all crops.
152 farms, Pingsiang Hsien, Chihli, China (1923)

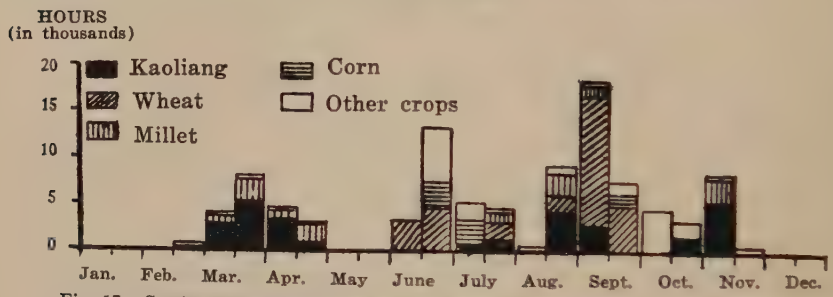

Fig. 17.—Semi-monthly distribution of total animal labor in hours for all crops.
133 farms, Yenshan Hsien, Chihli, China (1923)

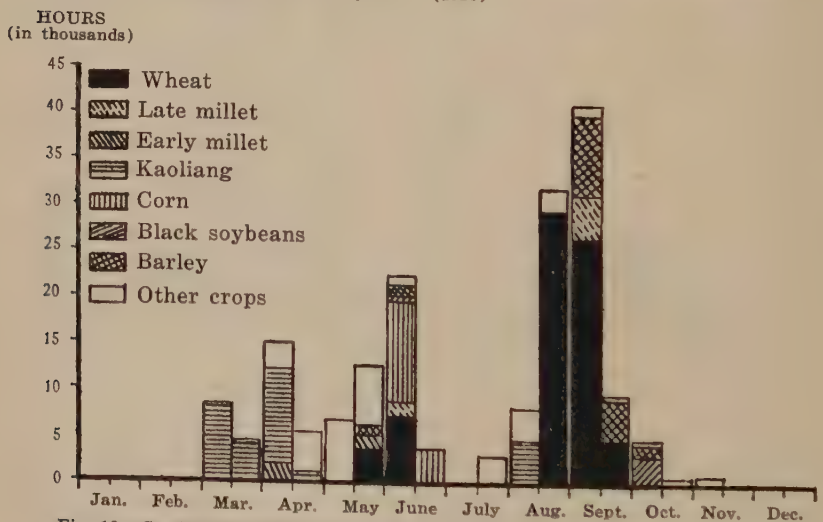

Fig. 18.—Semi-monthly distributionn of total animal labor in hours for all crops.
144 farms, Sincheng Hsien, Honan, China (1923)

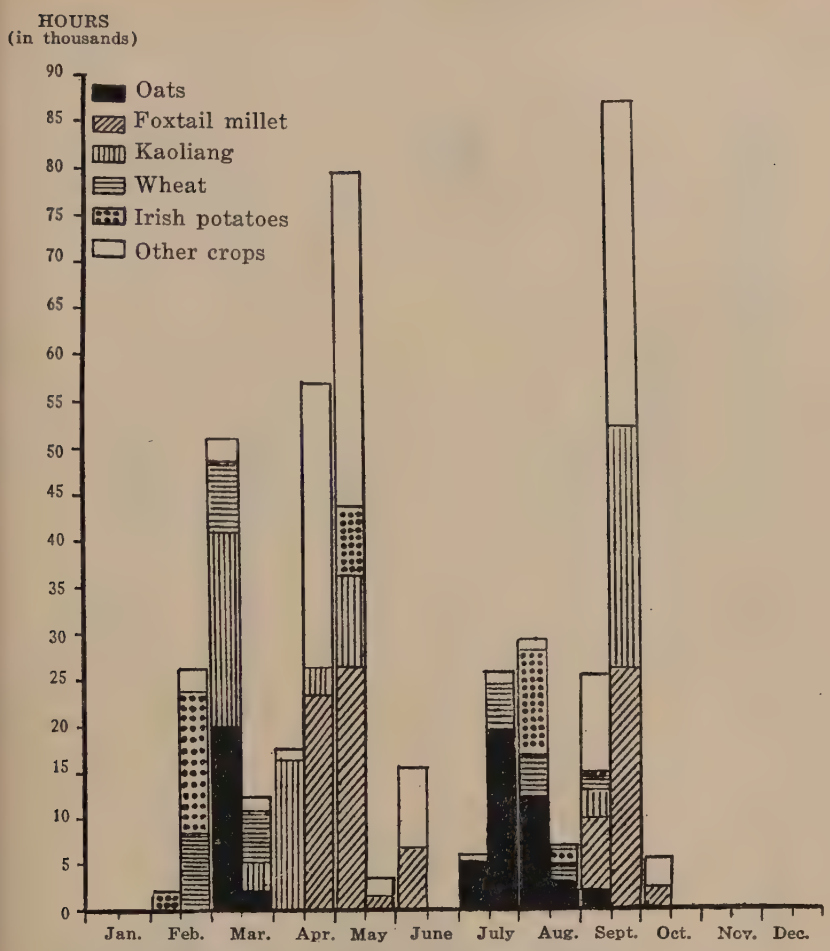

Fig. 19.—Semi-monthly distribution of animal labor in hours for all crops.
226 farms, Wutai Hsien, Shansi, China (1922)

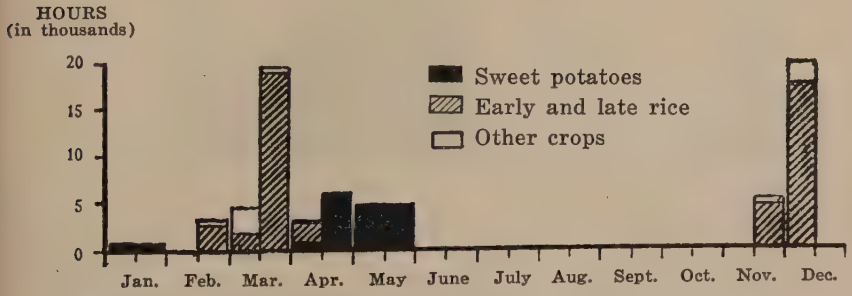

Fig. 20.—Semi-monthly distrbution of animal labor in hours for all crops.
166 farms, Lienkiang Hsien, Fukien, China (1923)

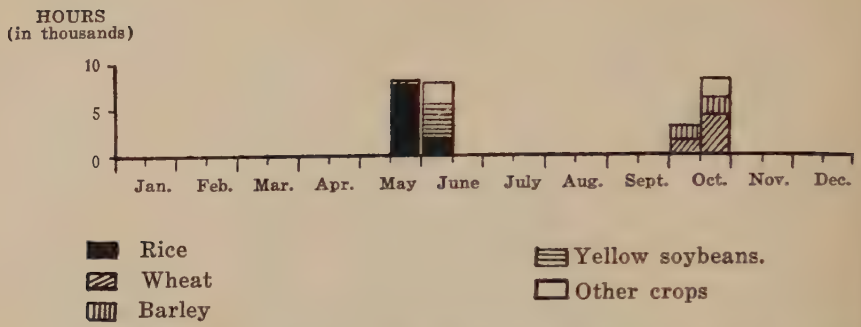

Fig. 21.—Semi-monthly distribution of total animal labor in hours for all crops.

217 farms, Kiangning (T), Kiangsu, China (1924)

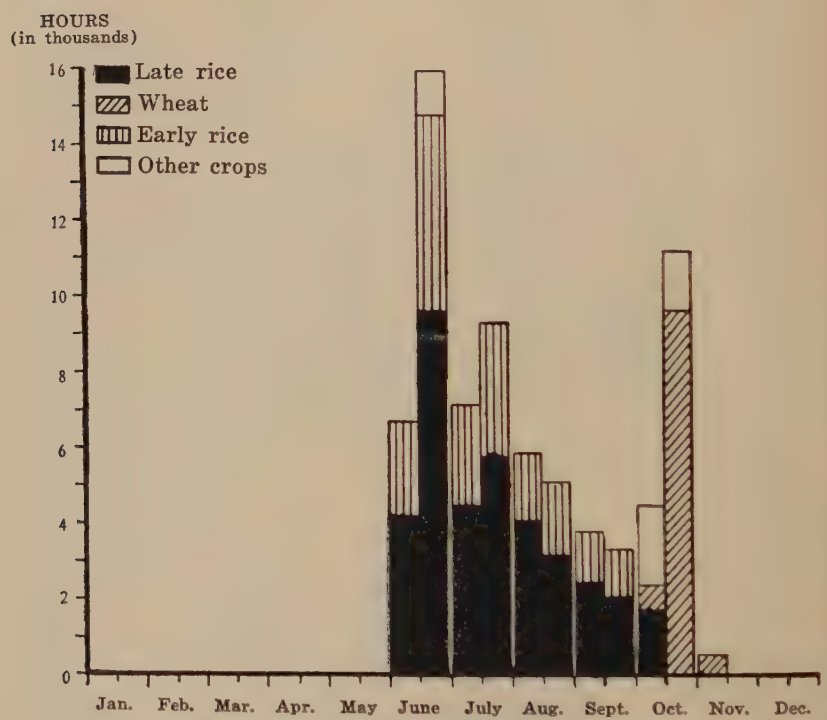

Fig. 22.—Semi-monthly distribution of total animal labor in hours for all crops.

300 farms, Wuchin, Kiangsu, China (1923-1924).

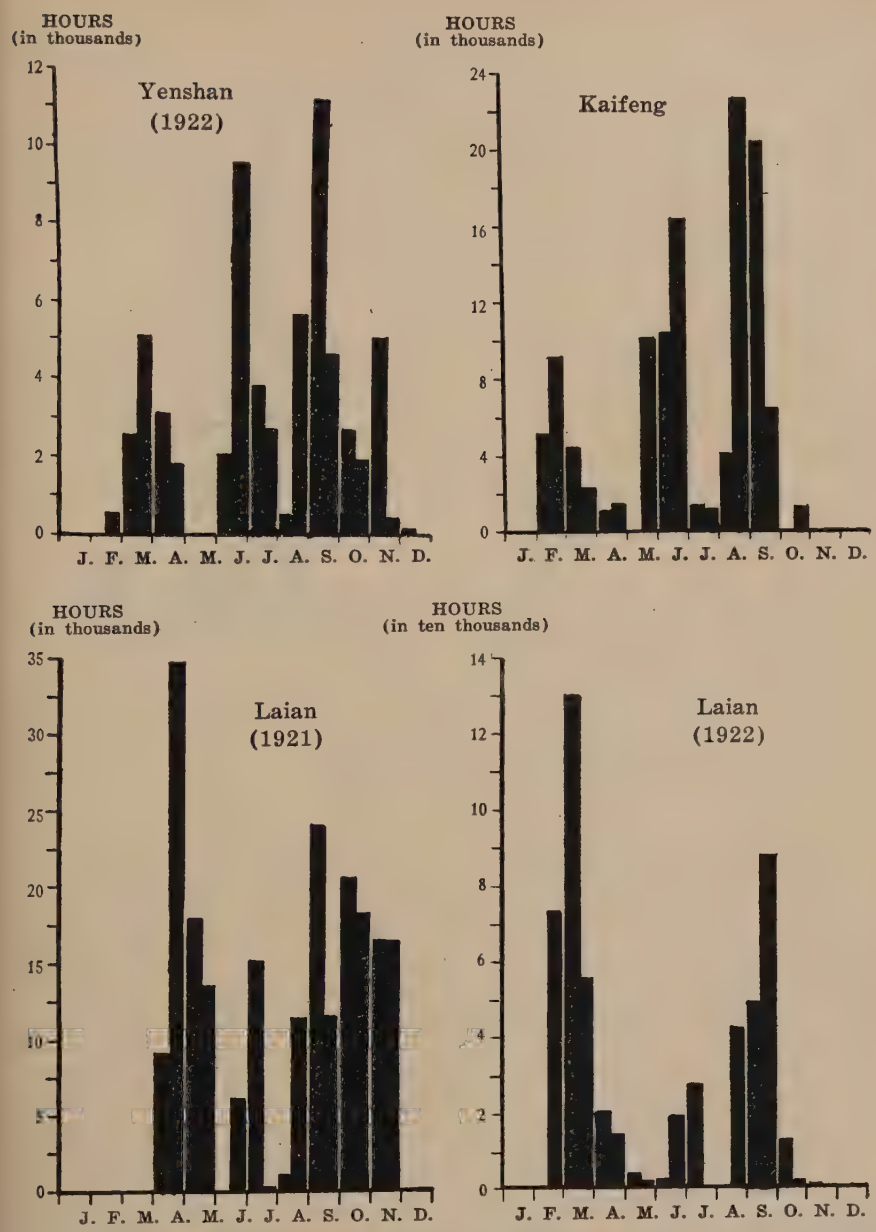

Fig. 23.—Semi-monthly distribution of all animal labor in four localities, China.

Yenshan Hsien (1922) Chihli, 150 farms. Kaifeng Hsien, Honan, 149 farms (1924). Laian Hsien (1921) Anhwei, 101 farms. Laian Hsien (1922), 100 farms.

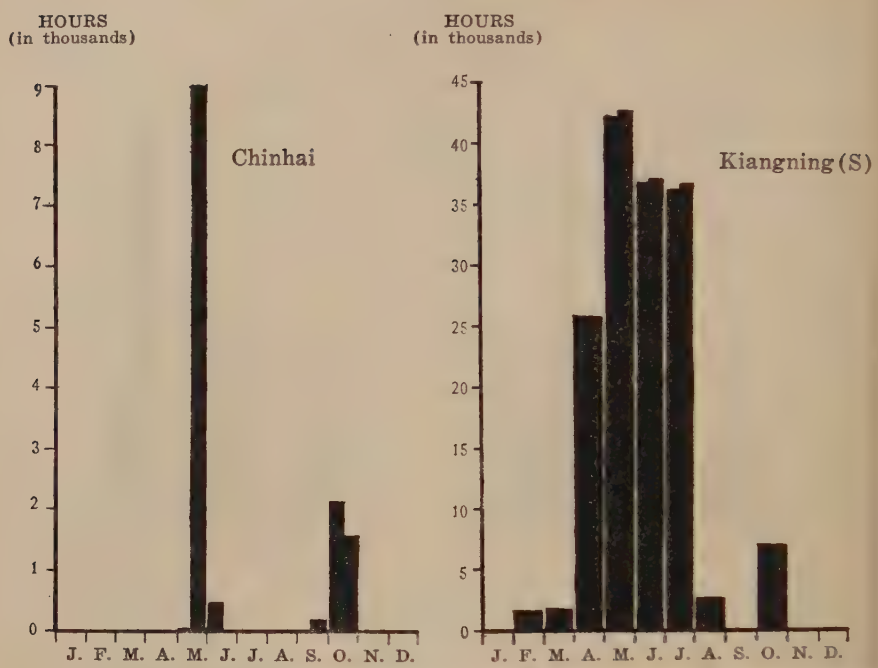

Fig. 24.—The semi-monthly distribution of all animal labor in two localities, China

Chinhai Hsien, Chekiang, 67 farms (1921)
Kiangning Hsien, Kiangsu, 203 farms (1923)

The problem of winter work for the farmer in China is not easy of solution. In many Western countries the care of animals in the dairy and animal industry and the growing of fruits provide much winter work. In China supplementary work either at home or away from home is one possible way of providing better utilization of the farmer's time. To a very limited extent this is already being done by farmers. For instance, particularly on the farms in Su Hsien, Anhwei women and children members of the farm family may be seen making winter shoes for sale from cow's hair—a felt shoe which takes very much the same place as the felt boot in the United States. It is a common practice for certain members of the family, especially the young men, to go to the cities to find winter employment of various kinds. To what extent new industries either in the home or small

TABLE 33. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

124 farms, Hwaiyuan Hsien, Anhwei, China

Months	First or second half	Peanuts	Muskmelon	Millet	Wheat and field peas	Cotton	Watermelons	Indigo
January	1st	22.6	...	...	...	8.9	...	...
	2nd	...	...	...	...	...	...	...
February	1st	...	...	...	...	...	31.3	...
	2nd	...	...	...	...	27.5	38.8	...
March	1st	...	108.8	...	11.0 M.	10.0	60.0	...
	2nd	37.7	...	...	9.2 M.	36.1	16.2	20.5
April	1st	...	135.8	...	...	60.9	...	25.0
	2nd	276.6 Pt.	...	121.9 Pt.	...	71.5	...	34.2
May	1st	...	...	...	...	...	...	...
	2nd	...	112.1	...	...	...	...	60.6
June	1st	...	...	...	34.8 (1)	...	...	9.1
	2nd	...	...	...	14.7 M.	...	...	27.3
July	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
August	1st	...	...	83.9 Ht.	13.4 M.	...	...	...
	2nd	...	...	...	40.3 M.	...	...	...
September	1st	...	...	...	12.2 M.	...	...	...
	2nd	...	...	...	42.7 F.	...	...	...
October	1st	...	...	...	68.4 (2)	...	...	...
	2nd	113.1 Ht.	...	...	24.4 (3)	...	...	...
November	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	31.2	...
December	1st	...	18.3	20.3	...	4.4	...	...
	2nd	...	30.4	66.8	...	26.7	32.5	27.3
Total		*450.0*	*405.4*	*292.9*	*271.1*	*246.0*	*210.0*	*204.0*

(1) 18.3 Ht., 16.5 Th.

(2) 48.8 Pw., 19.6 Hw.

(3) 18.3 Pw., 6.1 Hw.

TABLE 33.—*(Continued)*

Months	First or second half	Hemp	Barley	Rice	Kaoliang	Sesame and soybeans	Sesame and small beans	Soybeans
January	1st	45.1	...	3.8 F.	...	...	...	...
	2nd	...	...	4. 3F.	...	...	...	...
February	1st	25.0	...	9.1 (9)	...	...	...	...
	2nd	...	...	4.1 (10)	...	...	...	...
March	1st	...	...	21.8 (11)	...	...	...	...
	2nd	22.6	...	1.4 (12)	42.4 F.	...	...	...
April	1st	33.8	...	22.0 (13)	...	...	...	...
	2nd	63.9	...	2.4 (14)	48.6 (20)	...	...	...
May	1st	...	...	...	...	...	...	...
	2nd	...	29.7 (4)	...	...	58.8	15.4	...
June	1st	...	...	14.0 (15)	...	46.0	96.0	114.1
	2nd	...	...	49.5 (16)	...	...	...	...
July	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
August	1st	...	3.6 M.	...	16.9 (21)	...	...	...
	2nd	...	7.2 M.	...	...	...	...	...
September	1st	...	26.4 M.	13.0 (17)	5.4 Th.	...	31.0 Ht.	...
	2nd	...	17.8 (5)	2.7 (18)	...	45.0 Ht.	...	20.5 Ht.
October	1st	...	34.9 (6)	10.5 (19)	...	...	...	...
	2nd	...	48.7 (7)	...	44.4 M.	...	...	...
November	1st	...	11.9 (8)	...	...	...	...	...
	2nd	...	...	5.0 M.	...	...	...	...
December	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
Total		*190.4*	*180.2*	*163.6*	*157.7*	*149.8*	*142.4*	*134.6*

(4) 15.9 Ht., 13.8 Th.
(5) 3.3 Pw., 0.7 Hw., 3.9 F., 9.9 M.
(6) 19.8 Pw., 6.2 Hw., 8.9 F.
(7) 28.8 Pw., 9.2 Hw., 10.7 F.
(8) 8.9 Pw., 3.0 Hw.
(9) 0.6 F., 8.5 M.
(10) 0.6 F., 3.5 M.
(11) 6.9 Pw., 1.9 Hw., 5.2 F., 3.5 M., 4.3 Pt.
(12) 0.7 F., 0.7 M.
(13) 14.6 Pw., 3.6 Hw., 3.8 Pt.
(14) 1.9 Pw., 0.5 Hw.
(15) 11.3 Pw., 2.7 Hw.
(16) 40.4 Pw., 9.1 Hw.
(17) 7.2 Ht., 5.8 Th.
(18) 1.7 Ht., 1.0 Th.
(19) 6.3 Ht., 4.2 Th.
(20) 36.1 Pw., 12.5 Hw.
(21) 11.3 Ht., 5.6 Th.

TABLE 33.—*(Continued)*

Months	First or second half	Sweet potatoes	Carrots	Wheat	Green beans	Sesame	Other crops
January	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	...
February	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	...
March	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	...
April	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	5.9
May	1st	...	...	...	...	...	...
	2nd	...	...	9.1 Ht.	...	12.6	...
June	1st	70.4	...	22.8 (22)	...	67.3	...
	2nd	10.5	...	1.9 (23)	6.2	9.1	2.4
July	1st	...	...	1.1 Th.	37.3	...	14.0
	2nd	...	75.7	...	24.9	...	9.3
August	1st	...	45.7	...	...	...	4.0
	2nd	...	...	...	...	...	...
September	1st	...	...	...	...	12.0 Ht.	...
	2nd	...	...	31.4 F.	...	...	...
October	1st	24.4 Ht.	...	36.1 (24)	14.3 Ht.	...	5.4
	2nd	25.5 Ht.	...	14.2 (25)	11.2 Ht.	...	4.3
November	1st	...	...	...	...	...	...
	2nd	...	...	...	...	...	...
December	1st	...	...	...	...	...	1.0
	2nd	...	...	...	...	...	3.2
Total		*130.8*	*121.4*	*116.6*	*93.9*	*101.0*	*49.5*

(22) 4.4 Ht., 18.4 Th.
(23) 0.7 Ht., 1.2 Th.

(24) 24.1 Pw., 6.1 Hw., 5.9 F.
(25) 11.8 Pw., 2.4 Hw.

TABLE 34. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

286 farms, Su Hsien, Anhwei, China (1924)

Months	First or second half	Millet	Proso millet	Kaoliang	Peanuts	Hemp	Field peas	Barley and field peas	Cotton
February ..	1st	11.8	16.2	16.4 F.	5.2	18.3	...	...	31.2
	2nd	28.7	67.8	9.1 (1)	15.5	7.5	...	...	34.3
March	1st	50.7	17.2	42.2 (2)	8.3	45.2	...	...	3.1
	2nd	36.0	11.5	38.6 (3)	56.9	28.0 Pt.	...	...	...
April	1st	...	...	24.0 (4)	18.6	26.9 Pt.	...	...	9.3
	2nd	18.6 Pt.	24.8 Pt.	...	11.4	...	...	...	17.9 Pt.
May	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	8.1	...	...	...	...
June	1st	...	...	...	7.0	...	65.5 (7)	37.4 Ht.	...
	2nd	...	...	...	...	...	...	...	...
July	1st	...	...	...	...	23.0 Ht.	...	...	...
	2nd	20.3 Ht.	58.0 Ht.	...	...	42.4 Ht.	...	...	...
August	1st	10.1 Ht.	...	54.5 (5)	...	...	...	5.5	...
	2nd	...	...	...	...	...	...	9.3	...
September ..	1st	...	...	...	...	...	...	28.6	...
	2nd	...	...	...	...	...	...	77.1 Pt.	...
October	1st	...	3.8	...	9.3 Ht.	...	100.8 (8)	31.7 Pt.	18.4
	2nd	65.3	47.8	36.4 (6)	94.0 Ht.	23.7	41.1 (9)	...	9.3
November ..	1st	21.4	15.3	31.1 Pw.	22.7	23.7	...	...	24.9
	2nd	...	...	1.3 Pw.	4.1	...	...	...	12.5
December ..	1st	30.4	26.8	4.0 Pw.	20.7	3.2	...	...	...
	2nd	37.2	38.2	60.9 Pw.	14.5	32.3	...	...	18.7
Total		*330.5*	*327.4*	*318.5*	*296.3*	*274.2*	*207.4*	*189.6*	*179.6*

(1) 1.3 Hw., 7.8 F.
(2) 40.8 Pw., 1.4 Hw.
(3) 19.1 Pw., 19.5 Hw.
(4) 1.3 Pw., 8.9 Hw., 5.8 Pt., 8.0 M.
(5) 23.5 Ht., 16.0 Th., 15.0 M.
(6) 33.7 Pw., 2.7 Th.
(7) 32.4 Ht., 33.1 Th.
(8) 65.8 Pw., 23.9 Hw., 7.2 F. 3.9 Pt.
(9) 30.0 Pw., 8.7 Hw., 2.4 Pt.

TABLE 34.—*(Continued)*

Months	First or second half	Barley	Barley (hulless)	Watermelons	Winter radish	Wheat	Broad beans	Buckwheat	Wheat and field peas
February ..	1st	...	...	304	...	...	...	...	...
	2nd	...	...	10.1	...	...	...	...	...
March	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
April	1st	...	...	60.7	...	...	...	...	...
	2nd	...	...	20.2	...	...	...	...	...
May	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	2.5 (16)	...	...	...
June	1st	38.0 (10)	47.7 Ht.	...	...	19.0 (17)	81.5 Ht.	...	31.6 (23)
	2nd	...	...	...	...	5.6 Th.	...	...	...
July	1st	...	...	...	87.1 Pt.	...	...	...	...
	2nd	3.8 Pw.	...	...	39.3 Pt.	1.7 Pw.	...	...	...
August	1st	2.8 Pw.	...	...	19.7 Pt.	28.8 (18)	...	...	...
	2nd	5.2 (11)	...	...	...	49.2 (19)	...	96.6 Pt.	...
September ..	1st	24.1 (12)	...	...	...	53.9 (20)	73.3	27.5 Pt.	13.1 (24)
	2nd	67.5 (13)	42.9 Pt.	...	...	6.6 (21)	...	...	44.9 (25)
October	1st	31.3 (14)	74.2 Pt.	...	...	3.4 (22)	...	10.5 Ht.	50.4 (26)
	2nd	2.4 (15)	8.7 Pt.	...	...	...	14.4	27.3 Ht.	12.1 (27)
November ..	1st	...	...	30.4	15.0 Ht.	...	...	...	...
	2nd	...	...	20.2	10.0 Ht.	...	...	...	...
December ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
Total		*175.1*	*173.5*	*172.0*	*171.1*	*170.7*	*169.2*	*161.9*	*152.1*

(10) 15.9 Ht., 22.1 Th.
(11) 3.8 Pw., 1.4 F.
(12) 18.8 Pw., 3.3 Hw., 2.0 F.
(13) 50.8 Pw., 13.9 Hw., 1.0 F., 1.8 Pt.
(14) 21.6 Pw., 6.1 Hw., 3.6 Pt.
(15) 1.9 Hw., 0.5 Pt.
(16) 0.8 Ht., 1.7 Th.
(17) 10.4 Ht., 8.6 Th.
(18) 23.3 Pw., 3.0 Hw., 2.5 F.
(19) 36.8 Pw., 9.0 Hw., 3.4 F.
(20) 39.4 Pw., 7.6 Hw., 0.4 F., 3.2 Pt., 3.3 M.
(21) 1.1 Pw., 3.8 Hw., 0.1 F., 1.6 Pt.
(22) 0.9 Hw., 1.4 Pt., 1.1 M.
(23) 14.9 Ht., 16.7 Th.
(24) 9.4 Pw., 1.6 Hw., 1.6 F., 0.5 Pt.
(25) 34.5 Pw., 8.6 Hw., 0.8 F., 1.0 Pt.
(26) 37.6 Pw., 8.1 Hw., 2.1 F., 2.6 Pt.
(27) 8.4 Pw., 3.2 Hw., 0.5 Pt.

TABLE 34.—*(Continued)*

Months	First or second half	Melons and cotton	Irish potatoes	Carrots	Onions	Thatching grass	Sesame	Corn	Melons and squash
February ..	1st	77.5	...	...	...	...	9.0	...	40.0
	2nd	...	...	...	...	8.1	11.2	...	10.0
March	1st	...	...	...	...	...	1.7	...	...
	2nd	...	...	...	...	...	10.7	...	...
April	1st	...	14.6	...	...	49.4	1.7	42.9	...
	2nd	11.3 Pt.	72.7	...	...	4.1	2.8 Pt.	7.1 Pt.	...
May	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
June	1st	...	...	...	...	...	7.0 Pt.	...	...
	2nd	...	...	...	60.0	...	19.0 Pt.	...	...
July	1st	...	...	19.7 Pt.	...	...	...	...	...
	2nd	...	...	55.5 Pt.	...	27.8	...	...	...
August	1st	...	...	42.0 Pt.	...	...	7.6 Ht.	32.1 Ht.	...
	2nd	...	...	...	...	...	6.3 Ht.	...	...
September ..	1st	...	...	...	...	...	7.0 Ht.	...	...
	2nd	...	16.4 Ht.	...	...	...	...	...	...
October	1st	...	32.7 Ht.	...	...	...	...	...	...
	2nd	...	...	...	35.0 Ht.	8.1 Ht.	11.2	...	...
November ..	1st	55.0	...	11.9 Ht.	35.0 Ht.	24.7 Ht.	...	14.3	40.0
	2nd	...	...	7.2 Ht.	...	...	...	...	...
December ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	20.3	...	...
Total		*143.3*	*136.4*	*136.3*	*130.0*	*122.2*	*115.5*	*96.4*	*90.0*

TABLE 34.—*(Continued)*

Months	First or second half	Squash	Tobacco	Red beans	Black beans	Rice	Green beans	Soybeans	Other crops
February ..	1st	25.0	30.0	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
March	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
April	1st	25.0	...	...	...	...	...	...	14.5
	2nd	...	...	...	...	...	...	...	72.3
May	1st	...	...	...	...	...	...	...	...
	2nd	...	...	3.0 Pt.	3.3 Pt.	1.4 Pt.	...	1.5 Pt.	...
June	1st	...	...	9.1 Pt.	6.4 Pt.	3.0 Pt.	0.6 Pt.	8.4 Pt.	...
	2nd	...	...	0.6 Pt.	1.8 Pt.	0.7 Pt.	8.8 Pt.	...	...
July	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	0.6 Pt.	...	...
August	1st	...	...	4.0 Ht.	...	...	6.7 Ht.	...	...
	2nd	...	...	19.7 Ht.	...	...	13.5 Ht.	...	...
September ..	1st	...	...	4.0 Ht.	6.1 Ht.	5.6 Ht.	1.2 Ht.	8.2 (28)	...
	2nd	...	...	...	16.0 Ht.	18.6 Ht.	...	13.3 (29)	16.3
October	1st	...	...	...	4.5 Ht.	2.6 Ht.	...	...	32.5
	2nd	...	...	...	...	...	...	...	...
November ..	1st	25.0	30.0	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
December ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
Total		*75.0*	*60.0*	*40.4*	*38.1*	*31.9*	*31.4*	*31.4*	*135.6*

(28) 4.2 Ht., 4.0 Th.
(29) 6.2 Ht., 7.1 Th.

TABLE 35. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

152 farms, Pingsiang Hsien, Chihli, China (1923)

Months	First or second half	Wheat	Millet	Hemp	Soybeans	Vegetables	Kaoliang	Other crops
January	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
February	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
March	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
April	1st	6.9 It.	...	...	...	...	...	0.3
	2nd	6.9 It.	46.4 (5)	70.0 Pt.	58.6	...	59.6 (11)	56.9
May	1st	...	...	17.7	...	...	...	...
	2nd	7.4 It.	...	11.8	...	...	...	0.3
June	1st	30.5 (1)	25.1 (6)	6.5	...	...	...	1.1
	2nd	37.8 Pw.	2.0 Pt.	...	...	40.2	...	1.4
July	1st	22.9 Pw.	...	22.2 Ht.	...	33.5	...	0.9
	2nd	30.0 (2)	18.7 (7)	...	...	23.1	...	1.1
August	1st	16.9 (3)	28.3 (8)	...	...	...	1.1 Ht.	1.1
	2nd	36.3 (4)	15.4 (9)	...	26.8 Ht.	...	4.3 (12)	18.1
September	1st	1.7 Pw.	33.9 (10)	...	...	...	4.9 M.	2.0
	2nd	...	12.7 Pw.	14.9	42.7	...	32.7 Pw.	37.0
October	1st	...	...	...	...	29.9 Ht.	...	...
	2nd	7.2 It.	...	...	...	...	...	0.3
November	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
December	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
Total		*204.5*	*182.5*	*143.1*	*123.1*	*126.7*	*102.6*	*120.5*

(1) 14.3 Ht., 15.2 Th., 1.0 M.
(2) 29.1 Pw., 0.9 Hw.
(3) 8.0 Pw., 8.9 Hw.
(4) 16.3 Pw., 6.8 Hw., 3.2 F., 10.5 Pt.
(5) 36.1 Pw., 5.3 Hw., 5.0 Pt.
(6) 20.3 Pw., 4.3 Hw., 0.5 Pt.
(7) 18.0 It., 0.7 Ht.
(8) 18.1 It., 9.8 Ht., 0.4 Th.
(9) 8.7 Ht., 6.7 Th.
(10) 19.9 Pw., 14.0 Th.
(11) 44.9 Pw., 8.6 Hw., 6.1 Pt.
(12) 3.2 Th., 1.1 M.

TABLE 36. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

133 farms, Yenshan Hsien, Chihli, China (1923)

Months	First or second half	Kaoliang	Millet	Corn	Wheat	Other crops
February ..	1st	...	...	...	...	...
	2nd	5.2 F.	3.4 F.	...	...	0.2
March	1st	22.5 (1)	15.4 (6)	...	...	0.8
	2nd	42.7 (2)	34.4 (7)	...	...	1.7
April	1st	26.1 (3)	19.3 Pt.	...	...	1.0
	2nd	8.1 F.	29.4 F.	...	...	1.2
June	1st	...	...	...	13.9 Ht.	...
	2nd	1.2 Ct.	...	59.8 (14)	18.3 (17)	40.5
July	1st	8.1 Ct.	5.6 Ct.	47.3 (15)	0.9 Th.	7.2
	2nd	11.7 Ct.	19.6 Ct.	...	6.2 (18)	0.9
August	1st	...	8.6 (8)	1.9 Ct.	...	0.6
	2nd	32.2 Ht.	32.9 (9)	4.2 Ct.	8.2 (19)	2.2
September ..	1st	32.1 Th.	17.2 (10)	7.2 (16)	54.4 (20)	2.1
	2nd	...	...	34.2 Ht.	18.1 (21)	5.1
October	1st	...	...	3.8 Ht.	0.8 Pt.	24.1
	2nd	17.3 (4)	...	...	...	5.4
November ..	1st	43.1 (5)	35.6 (11)	...	...	1.8
	2nd	...	10.2 (12)	...	...	0.4
December ..	1st	...	3.8 (13)	...	...	0.1
	2nd	...	...	...	...	...
Total		*240.3*	*235.4*	*158.4*	*120.8*	*95.3*

(1) 7.0 Pw., 4.2 Hw., 11.3 F.
(2) 19.0 Pw., 20.8 Hw., 2.9 F.
(3) 8.9 F., 17.2 Pt.
(4) 10.9 Pw., 6.4 Hw.
(5) 24.7 Pw., 18.4 Hw.
(6) 9.0 Pw., 6.4 Hw.
(7) 21.2 Pw., 13.2 Hw.
(8) 5.7 Ht., 2.9 Th.
(9) 30.3 Ht., 2.6 M.
(10) 15.6 Th., 1.6 M.
(11) 21.0 Pw., 14.6 Hw.
(12) 7.7 Pw., 2.5 Hw.
(13) 2.5 Pw., 1.3 Hw.
(14) 27.8 Pw., 13.1 Hw., 1.9 F., 17.0 Pt.
(15) 3.8 Hw., 43.5 F.
(16) 4.2 Ct., 3.0 Ht.
(17) 4.6 Pw., 1.9 Ht., 8.7 Th., 3.1 M.
(18) 4.7 Pw., 1.5 Hw.
(19) 5.2 Pw., 1.6 Hw., 1.4 F.
(20) 35.6 Pw., 13.5 Hw., 5.3 Pt.
(21) 2.8 Pw., 3.7 Hw., 11.6 Pt.

factories can be successfully introduced in the country district is a question which needs careful study. It may be that the large supply of cheap man and animal labor in the country can offset the high efficiency that comes of having big factories in the large cities, and that in the long run, both economically and socially, the nation will be better off by developing factories on the small unit basis. At least it is matter to be seriously considered and data should be brought together and even experiments tried to discover its practicability.

DISTRIBUTION OF MAN AND ANIMAL LABOR FOR INDIVIDUAL CROPS BY KINDS OF WORK

The amount of man and animal labor required for each operation for the different crops is shown in tables 42-50. The percentage of labor expended on each crop in proportion to the total labor on all crops is also given in tables 24-32. The

TABLE 37. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

144 farms, Sincheng Hsien, Honan, China (1923)

Months	First or second half	Sesame	Kaoliang	Early millet	Barley	Buckwheat	Sweet potatoes	Seed melons	Corn
March	1st	...	126.2 F.	...	...	...	...	...	...
	2nd	...	62.5 F.	...	...	...	...	...	...
April	1st	...	151.0 (1)	177.9	...	...	...	172.0	...
	2nd	198.1	16.1 Pt.	...	...	...	...	103.2	...
May	1st	...	...	27.7	...	...	203.1 F.	18.6 Pt.	...
	2nd	250.2 Pt.	...	142.8 Pt.	18.0 Ht.	...	103.7 (4)	...	...
June	1st	...	...	...	34.7 Th.	...	...	...	189.5 F.
	2nd	...	...	...	...	...	...	...	64.5 Pt.
July	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	135.9	...	...	...
August	1st	...	68.4 (2)	...	...	165.1 Pt.	...	...	...
	2nd	12.9 Ht.	...	...	...	...	...	...	...
September ..	1st	...	...	57.1 Ht.	196.1 F.	...	...	...	...
	2nd	...	...	...	99.8 (3)	...	...	...	...
October	1st	...	...	...	24.9 Pt.	...	...	...	...
	2nd	...	...	...	...	44.4 Ht.	...	...	...
November ..	1st	...	...	...	...	...	31.1 Ht.	...	...
	2nd	...	...	...	...	...	...	...	...
Total		*461.2*	*424.2*	*405.5*	*373.5*	*345.4*	*337.9*	*293.8*	*254.0*

(1) 124.3 Pw., 26.7 Hw.

(2) 36.8 Ht., 31.6 Th.

(3) 71.6 Pw., 28.2 Hw.

(4) 71.7 Pw., 32.0 Hw.

TABLE 37.—*(Continued)*

Months	First or second half	Wheat	Late millet	Black beans	Millet and green beans	Green beans	Sesame and green beans	Other crops
March	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
April	1st	...	...	...	...	...	...	20.8
	2nd	...	...	...	...	...	...	12.5
May	1st	...	...	...	...	...	...	2.2
	2nd	12.7 Ht.	...	...	...	...	...	0.9
June	1st	24.8 Th.	18.2 Pt.	15.5 Pt.	18.1 Pt.	19.8 Pt.	16.0 Pt.	14.3
	2nd	...	...	...	...	...	...	...
July	1st	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...
August	1st	...	...	...	...	...	...	...
	2nd	101.6 F.	...	...	...	...	...	7.6
September	1st	92.2 (5)	57.1 Ht.	...	46.4 Ht.	21.5 Ht.	...	6.9
	2nd	17.2 Pt.	...	...	...	17.9 Ht.	27.9 Ht.	1.3
October	1st	...	...	54.4 Ht.	...	...	...	43.7
	2nd	...	...	...	...	...	...	...
November	1st	...	...	...	...	..	...	...
	2nd	...	...	...	...	...	...	...
Total		*248.5*	*75.3*	*69.9*	*64.5*	*59.2*	*43.9*	*110.2*

(5) 69.7 Pw., 22.5 Hw.

TABLE 38. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

226 farms, Wutai Hsien, Shansi, China (1922)

MONTHS	First or second half	Irish potatoes	Foxtail millet	Kaoliang	Wheat	Oats	Other crops
February	1st	16.3 F.	...	...	...	...	...
	2nd	136.2 F.	...	...	52.6 F.	...	4.4
March	1st	...	...	69.8 Pw.	47.6 (4)	42.8 Pt.	5.4
	2nd	...	...	10.5 F.	35.1 Pt.	4.4 Pt.	3.1
April	1st	...	...	51.1 F.	2.5 Pt.	...	1.2
	2nd	...	70.3 Pw.	9.3 F.	...	...	63.2
May	1st	73.2 Pt.	79.0 (1)	32.0 Pt.	...	...	71.5
	2nd	...	4.3 Pt.	...	...	...	3.9
June	1st	...	19.9 Pt.	...	...	...	17.9
	2nd	...	...	...	...	...	...
July	1st	...	...	...	3.7 Ht.	11.3 Ht.	0.3
	2nd	...	...	...	32.6 (5)	45.7 (7)	2.7
August	1st	99.6 Pw.	...	...	27.6 Pw.	28.0 (8)	2.3
	2nd	13.2 Hw.	...	...	11.3 (6)	7.0 (9)	0.9
September	1st	3.0 Hw.	23.9 Ht.	9.3 Ht.	8.8 Hw.	4.4 Hw.	22.3
	2nd	...	78.5 (2)	83.1 (3)	...	...	72.1
October	1st	...	6.9 Hw.	...	...	...	6.2
	2nd	...	...	...	...	...	...
Total		*341.5*	*282.3*	*265.1*	*221.3*	*141.6*	*277.4*

(1) 78.0 F., 0.9 Pt.
(2) 70.2 Pw., 7.4 Hw., 0.9 Ht.
(3) 69.7 Pw., 13.4 Hw.
(4) 17.5 Hw., 27.6 F., 2.5 Pt.
(5) 27.6 Pw., 5.0 Ht.
(6) 2.5 Pw., 8.8 Hw.
(7) 1.8 Ct., 40.2 Pw., 1.7 Ht.
(8) 19.3 Pw., 8.7 Hw.
(9) 1.8 Pw., 5.2 Hw.

TABLE 39. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

161 farms, Lienkiang Hsien, Fukien, China (1923)

Months	First or second half	Late and early rice	Sweet potatoes	Other crops
January	1st	...	18.7 Pw.	2.6
	2nd	...	18.7 Pw.	2.6
February	1st	28.0 Pw.	...	16.8
	2nd	18.7 Pw.	...	11.2
March	1st	194.3 (1)	...	116.7
	2nd	18.7 Hw.	...	11.2
April	1st	...	18.7 Pw.	2.6
	2nd	...	89.7 (2)	12.7
May	1st	...	65.3 (3)	9.2
	2nd	...	65.3 (4)	9.2
November	1st	...	...	...
	2nd	46.7 Pw.	...	28.1
December	1st	177.4 Pw.	...	106.6
	2nd	...	...	...
Total		*483.8*	*276.4*	*329.5*

(1) 37.3 Pw., 138.3 Hw., 18.7 F.
(2) 43.0 Pw., 46.7 Hw.
(3) 46.6 Pw., 18.7 Hw.
(4) 56.0 Hw., 9.3 F.

tables may be used to determine which kinds of operations are most time consuming. Those taking much time should be considered in the light of possible methods of reducing the work. Take, for instance, the cultivation of kaoliang. It consumes a large proportion of total labor expended on the crop and at Hwaiyuan Hsien, Anhwei, it amounts to over two-thirds of all the labor on the crop. The question arises as to whether or not the horse cultivator could be used profitably to save labor, even though possibly the rows of kaoliang might have to be planted farther apart. The same situation applies to a number of other crops, such, for instance, as sweet potatoes, cotton, and sesame. Much of the cultivation occurs at a time when there is no great rush of work and for this reason since farm labor often cannot be otherwise profitably employed, the benefits of using a horse cultivator may not prove to be as great as otherwise might be the case.

Harvesting and threshing are other forms of labor requiring usually from about one-fifth to one-third of the labor of a crop. Both of these operations can be performed much more quickly by machinery. Such work usually occurs when there is so much to be done as to necessitate hiring labor, even to the point when the available supply may be exhausted. For this reason, self-rake reapers and small threshing outfits may prove profitable.

TABLE 40. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

217 farms, Kiangning (T) Hsien, Kiangsu, China (1924)

MONTHS	First or second half	Glutinous rice	Winter radish	Sweet potatoes	Sesame and green beans	Cotton	Corn and soybeans	Watermelons and cow peas	Sesame and soybeans
January ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	10.7	...	...	...
February ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
March	1st	...	...	...	10.5	...	...	...	...
	2nd	...	...	11.6	...	...	...	46.3	...
April	1st	...	...	10.5	...	...	...	11.3	...
	2nd	...	...	...	...	52.1	...	...	...
May..	1st	...	...	...	...	...	...	...	...
	2nd	19.0	...	...	30.3	...	...	...	...
June	1st	101.6	...	...	28.9	...	60.1 (1)	...	56.4
	2nd	...	...	49.0	...	...	...	...	...
July	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
August	1st	...	...	...	...	...	...	...	...
	2nd	...	38.3	...	...	...	...	...	...
September ..	1st	...	35.0	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
October	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
November ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
December ..	1st	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...
Total		*120.6*	*73.3*	*71.1*	*69.7*	*62.8*	*60.1*	*57.6*	*56.4*

(1) 42.5 Pw., 17.6 Hw.

TABLE 40.—*(Continued)*

Months	First or second half	Rice	Soybeans	Sesame	Broad beans	Corn	Barley	Field peas	Wheat	Other crops
January ..	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
February ..	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
March	1st	...	...	...	...	...	...	...	...	6.5
	2nd	...	...	...	...	...	...	...	...	16.2
April	1st	...	...	...	...	...	...	...	...	5.0
	2nd	...	...	...	...	...	...	...	...	0.7
May..	1st	...	...	...	...	...	...	...	...	...
	2nd	43.7 (2)	44.4	...	...	...	...	...	...	18.8
June	1st	11.4 (3)	10.7	54.5 (4)	...	54.1	...	...	...	17.9
	2nd	...	...	...	...	...	...	...	...	...
July	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
August	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
September ..	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
October	1st	...	...	...	...	...	17.7 (5)	...	12.5 (7)	...
	2nd	...	...	...	54.3	...	26.5 (6)	43.4 Pt.	28.0 (8)	...
November ..	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
December ..	1st	...	...	...	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
Total		*55.1*	*55.1*	*54.5*	*54.3*	*54.1*	*44.2*	*43.4*	*40.5*	*65.1*

(2) 32.3 Pw., 11.4 Hw.
(3) 7.8 Pw., 3.6 Hw.
(4) 40.9 Pw., 13.6 Hw.
(5) 12.8 Pw., 4.9 Hw.
(6) 21.2 Pw., 5.3 Hw.
(7) 9.9 Pw., 2.6 Hw.
(8) 21.9 Pw., 6.1 Hw.

TABLE 41. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER HECTARE FOR EACH CROP

300 farms, Wuchin Hsien, Kiangsu, China (1924)

Months	First or second half	Early rice	Late rice	Wheat	Rapeseed	Field peas	Broad beans	Barley	Glutinous rice	Wheat and field peas
June	1st	26.7 Pw.	22.7 Pw.	...	...	...	...	...	...	...
	2nd	55.2 (1)	51.9 (2)	...	...	...	...	...	64.3	...
July	1st	28.5 It.	24.1 It.	...	...	...	...	...	...	...
	2nd	38.4 It.	31.0 It.	...	...	...	...	...	...	...
August	1st	19.2 It.	22.1 It.	...	...	...	...	...	...	...
	2nd	20.6 It.	16.9 It.	...	...	...	...	...	...	...
September ..	1st	14.7 It.	13.2 It.	...	...	...	...	...	...	...
	2nd	13.3 It.	11.2 It.	...	...	...	...	...	...	...
October	1st	...	9.2 It.	3.4 (3)	50.3	53.4	59.9	53.1	...	21.9
	2nd	...	...	47.9 (4)	46.0	39.2	30.5	29.1	...	41.7
November ..	1st	...	...	2.5 (5)	...	...	...	...	...	...
	2nd	...	...	...	...	...	...	...	...	...
Total		*216.6*	*202.3*	*53.8*	*96.3*	*92.6*	*90.4*	*82.2*	*64.3*	*63.6*

(1) 30.4 Hw., 24.8 It.
(2) 33.8 Hw., 18.1 It.
(3) 1.5 Pw., 1.9 Hw.
(4) 22.5 Pw., 25.4 Hw.
(5) 1.2 Pw., 1.3 Hw.

TABLE 42. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

124 farms, Hwaiyuan Hsien, Anhwei (1925)

Kinds of work	Man labor							Animal labor					
	Rice	Kaoliang	Wheat	Sweet potatoes	Cotton	Sesame	Other crops	Rice	Wheat	Kaoliang	Barley	Wheat and field peas	Other crops
Plowing	10.8	3.9	16.4	0.4	1.9	7.0	...	45.9	30.8	22.9	33.8	24.8	...
Harrowing	2.4	1.4	3.9	...	0.6	1.8	...	10.9	7.3	7.9	10.6	9.5	...
Fertilizing	3.0	4.8	18.0	1.0	0.9	0.1	...	9.3	32.0	26.9	13.0	15.8	...
Planting	1.4	1.5	4.5	0.8	0.3	1.4	...	4.9	...	...	...	...	...
Transplanting	31.2	...	...	13.8	...	...	...	...	...	...	...	...	...
Cultivating	27.2	67.6	26.0	30.5	23.5	77.2	...	...	...	...	...	...	...
Harvesting	14.8	12.5	17.8	14.2	71.0	7.6	...	9.3	12.2	7.2	8.8	6.7	...
Threshing	6.1	3.5	13.4	...	...	4.9	...	6.7	17.7	7.0	7.7	6.1	...
Irrigating	...	...	...	9.8	...	...	...	...	...	...	...	...	...
Miscellaneous	3.1	4.8	...	29.5*	1.8	...	...	13.0	...	28.1	26.1	37.1	...
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	...	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	...
Per cent of total labor for each crop	*24.8*	*17.5*	*9.7*	*9.2*	*8.5*	*7.4*	*22.9*	*30.1*	*25.5*	*14.5*	*7.0*	*6.2*	*16.7*

*This includes 2.9 per cent for storing, 3.4 per cent for turning vines and 18.8 per cent for making beds.

TABLE 43. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

286 farms, Su Hsien, Anhwei, China (1924)

Kinds of work	Man labor					Animal labor						
	Kaoliang	Wheat	Soybeans	Wheat and field peas	Other crops	Wheat	Kaoliang	Barley	Wheat and field peas	Field peas	Soybeans	Other crops
Plowing	10.3	21.9	...	14.6	...	59.9	60.4	58.0	59.1	46.2	...	...
Harrowing	1.6	4.3	...	5.4	...	14.2	9.8	14.4	14.1	15.7	...	...
Fertilizing	3.7	4.6	...	2.6	...	3.8	7.6	2.5	3.0	3.5	...	...
Planting	1.5	6.4	7.7	4.4	...	3.6	1.8	3.4	3.0	3.0	31.5	...
Cultivating	40.5	16.3	31.3	15.2	...	...	...	...	...	...	...	...
Harvesting	32.7*	22.7	36.6	31.4	...	6.6	7.3	9.1	9.8	15.6	33.1	...
Threshing	5.4	17.5	18.5	17.4	...	9.3	5.9	12.6	11.0	16.0	35.4	...
Miscellaneous	4.3	6.3	5.9	9.0	...	...	4.7	...	...	...	...	...
Total	*100*	*100*	*100*	*100*	...	*100*	*100*	*100*	*100*	*100*	*100*	...
Per cent of total labor for each crop	*24.0*	*11.4*	*10.5*	*6.1*	*48.0*	*24.9*	*24.6*	*12.6*	*10.3*	*8.5*	*5.2*	*13.9*

*Cutting of kaoliang leaves before the grain is harvested constitutes 18.8 per cent of total labor.

TABLE 44. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

152 farms, Pingsiang Hsien, Chihli, China (1923)

Kinds of work	Man labor					Animal labor			
	Wheat	Vegetables	Millet	Kaoliang	Other crops	Wheat	Millet	Kaoliang	Other crops
Plowing	10.2	6.8	14.6	19.0	...	56.6	48.8	75.6	...
Harrowing	1.7	3.9	1.7	2.2	...	7.9	5.3	8.4	...
Fertilizing	3.2	8.3	0.9	...	...	1.6	...	...	...
Irrigating	58.5	27.4	10.7	...	...	13.9	19.8	...	...
Planting	3.1	12.0	3.4	2.7	...	5.1	4.1	6.0	...
Cultivating	3.3	27.1	34.3	41.6	...	...	...	...	...
Harvesting	9.2	14.5	13.7	17.7	...	7.0	10.5	3.1	...
Threshing	6.4	...	17.8	9.2	...	7.4	11.5	1.1	...
Miscellaneous	4.4	...	2.9	7.6	...	0.5	...	5.8	...
Total	*100*	*100*	*100*	*100*	...	*100*	*100*	*100*	...
Per cent of total labor for each crop	*31.1*	*13.3*	*14.9*	*9.7*	*25.5*	*32.7*	*25.6*	*11.5*	*30.2*

LABOR COST

Annual wages paid farm laborers employed by the year are low and vary from $26 in Yenshan Hsien (1922), Chihli, to $96 in Lienkiang Hsien, Fukien. In North China they average $41 compared with $79 in East Central China. In most localities the value of board supplied the

TABLE 45. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

133 farms, Yenshan Hsien, Chihli, China (1923)

Kinds of work	Man labor					Animal labor				
	Kaoliang	Wheat	Millet	Corn	Other crops	Kaoliang	Wheat	Millet	Corn	Other crops
Plowing	4.1	15.0	5.0	3.0	...	25.6	43.8	26.1	17.5	...
Harrowing	2.7	5.5	2.4	2.3	...	20.7	16.8	16.1	10.7	...
Fertilizing	9.6	1.1	16.4	11.4	...	15.2	1.2	13.9	28.7	...
Planting	3.6	13.4	4.7	4.2	...	7.2	14.6	8.2	10.7	...
Cultivating	30.7	...	28.8	34.2	...	8.7	...	10.7	6.5	...
Leaf cutting	8.3	...	...	...	...	...	...	...	...	...
Harvesting	9.0	26.9	13.5	12.0	...	13.4	13.1	15.3	25.9	...
Threshing	7.0	14.7	6.2	14.9	...	9.2	7.9	7.9	...	...
Miscellaneous	25.0	23.4	23.0	18.0	...	...	2.6	1.8	...	...
Total	*100*	*100*	*100*	*100*	...	*100*	*100*	*100*	*100*	...
Per cent of total labor for each crop	*33.8*	*17.1*	*14.7*	*10.6*	*23.8*	*31.0*	*30.7*	*16.0*	*7.6*	*14.7*

laborers is about the same in amount as the wages themselves. It is more nearly equal in East Central China while in North China wages amount to more than the value of board. Since the data were collected, wages have risen in price and therefore these figures do not represent the farm wage scale at present.

The cost of man labor, inclusive of the value of the operator's labor averages $50.93 per hectare, or approximately $20 per acre (table 51) in the seventeen localities, $22.60 in North China and $82.80 in East Central China. The lowest is $10.13 per hectare in Su Hsien, Anhwei, and the highest is $173.94 per hectare in Lienkiang Hsien, Fukien. The greater costs for East Central China are caused in part by more labor per hectare and by higher wages.

More important than the cost of labor per hectare is the proportion of labor cost, exclusive of operator's labor, to all farm expenses, which is 63.5 per cent, and which is practically the same for both North and East Central China (table 51). The lowest proportion is 28.5 for Wuchin Hsien, Kiangsu, and the highest is 81 per cent for Sincheng Hsien, Honan. Farm labor is cheap in China so far as wages per day or per year are concerned but in relation to total expenses it is by far the largest item.

TABLE 46. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

144 farms, Sincheng Hsien, Honan, China (1923)

Kinds of work	Man labor								Animal labor					
	Wheat	Millet (late)	Kao-liang	Corn	Sweet potatoes	Soy-beans (black)	Barley	Other crops	Wheat	Kao-liang	Barley	Corn	Sweet potatoes	Other crops
Plowing	11.4	...	9.3	...	5.6	...	8.8	...	28.0	29.2	19.2	...	21.2	...
Harrowing	3.6	...	2.0	...	2.5	...	3.5	...	9.1	6.3	7.5	...	9.5	...
Fertilizing	17.0	...	14.1	14.0	17.0	...	25.0	...	40.9	44.5	52.5	74.6	60.1	...
Planting	8.4	5.4	3.4	8.4	14.6	6.7	9.3	...	6.9	3.8	6.7	25.4	...	...
Cultivating	...	44.5	30.8	33.9	29.0	22.2	...	...	...	...	...	...	...	...
Harvesting	27.8	16.3	24.4	25.1	31.3	36.4	20.2	...	5.1	8.7	4.8	...	9.2	...
Threshing	31.8	33.8	16.0	18.6	...	34.7	33.2	...	10.0	7.5	9.3	...	...	...
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*	...	*100*	*100*	*100*	*100*	*100*	...
Per cent of total labor for each crop	*26.2*	*14.7*	*14.1*	*12.8*	*6.0*	*5.8*	*5.3*	*15.1*	*40.3*	*16.3*	*9.2*	*8.0*	*6.1*	*20.1*

TABLE 47. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

226 farms, Wutai Hsien, Shansi, China (1922)

Kinds of work	Man labor						Animal labor					
	Foxtail millet	Kao-liang	Oats	Irish potatoes	Wheat	Other crops	Oats	Foxtail millet	Kao-liang	Wheat	Irish potatoes	Other crops
Plowing	49.7	52.6	43.3	29.1	26.0	...	6.4	12.0	12.7	6.8	8.2	...
Harrowing	5.0	5.1	12.9	4.8	15.8	...	1.9	1.2	2.3	5.7	2.7	...
Fertilizing	27.6	26.7	...	44.7	36.2	...	...	6.3	6.6	13.6	12.3	...
Planting	8.9	12.1	33.3	21.4	18.1	...	5.1	3.8	6.1	9.0	28.7	...
Cultivating	...	...	1.3	...	...	...	21.4	21.4	21.1	...	18.4	...
Harvesting	8.8	3.5	9.2	...	3.9	...	18.3	18.5	18.9	21.2	29.7	...
Threshing	...	...	...	...	...	...	46.9	36.8	32.3	43.7	...	...
Total	*100*	*100*	*100*	*100*	*100*	...	*100*	*100*	*100*	*100*	*100*	...
Per cent of total labor for each crop	*20.9*	*18.7*	*13.9*	*8.7*	*7.8*	*30.0*	*21.0*	*19.6*	*17.0*	*7.2*	*7.0*	*28.2*

TABLE 48. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

161 farms, Lienkiang Hsien, Fukien, China (1923)

Kinds of work	Man labor			Animal labor		
	Early and late rice	Sweet potatoes	Other crops	Early and late rice	Sweet potatoes	Other crops
Plowing	13.2	8.8	...	63.7	52.7	...
Harrowing	9.1	11.7	...	32.4	43.9	...
Fertilizing	7.2	3.9	...	3.9	3.4	...
Planting	10.0	21.3	...	...	...	...
Cultivating	18.8	32.5	...	...	...	...
Harvesting	27.9	21.8	...	...	...	...
Threshing	13.8	...	...	...	...	...
Total	*100*	*100*	...	*100*	*100*	...
Per cent of total labor for each crop	*62.1*	*27.9*	*10.0*	*66.0*	*23.7*	*10.3*

EFFICIENCY OF MAN AND ANIMAL LABOR

The efficiency of man and animal labor is discussed in chapter IV and therefore will only be touched upon briefly here. From such discussion it is evident that one man or one animal performs more work on the larger farms than on the smaller ones because there is more work to be done and there is less loss in time in changing from one kind of work or from one field to another.

TABLE 49. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

217 farms, Kiangning (T) Hsien, Kiangsu, China (1924)

Kinds of work	Man labor						Animal labor					
	Rice	Wheat	Barley	Soybeans	Vegetables	Other crops	Rice	Wheat	Soybeans	Barley	Corn and soybeans	Other crops
Plowing	2.8	3.9	4.2	6.5	1.8	...	72.8	78.5	75.0	76.9	70.7	...
Harrowing	1.0	16.4	6.6	2.2	...	...	27.2	21.5	25.0	23.1	29.3	...
Fertilizing	1.7	11.8	12.6	0.7	28.3	...	...	...	...	...	...	...
Planting	8.8	1.0	2.2	4.0	2.4	...	...	...	...	...	...	...
Irrigating	39.6	...	...	...	55.7	...	...	...	...	...	...	...
Cultivating	21.8	21.5	31.2	47.3	...	...	...	...	...	...	...	...
Harvesting	11.3	20.2	19.3	16.8	0.7	...	...	...	...	...	...	...
Threshing	5.9	16.9	14.1	10.7	...	...	...	...	...	...	...	...
Miscellaneous	7.1	8.3	9.8	11.8	11.1	...	...	...	...	...	...	...
Total	*100*	*100*	*100*	*100*	*100*	...	*100*	*100*	*100*	*100*	*100*	...
Per cent of total labor for each crop	*41.0*	*20.2*	*9.3*	*8.1*	*8.1*	*13.3*	*36.0*	*23.2*	*13.2*	*12.0*	*5.7*	*9.9*

TABLE 50. AMOUNT OF MAN AND ANIMAL LABOR REQUIRED FOR EACH OPERATION OF THE DIFFERENT CROPS

300 farms, Wuchin Hsien, Kiangsu (1924)

Kinds of work	Man labor				Animal labor			
	Late rice	Wheat	Early rice	Other crops	Late rice	Early rice	Wheat	Other crops
Plowing	3.7	5.7	3.0	...	12.3	11.2	46.8	...
Harrowing	4.2	6.4	3.4	...	14.0	16.7	53.2	...
Fertilizing	2.0	5.2	2.1	...	...	...	...	...
Planting	12.8	2.8	13.7	...	...	...	...	...
Pumping	1.2	3.8	1.1	...	...	...	...	...
Irrigating	18.1	...	17.8	...	73.7	72.1	...	...
Cultivating	31.4	41.1	29.1	...	...	...	...	...
Harvesting	13.1	9.6	13.3	...	...	...	...	...
Threshing	6.8	8.4	6.5	...	...	...	...	...
Miscellaneous	6.7	17.0	10.0	...	...	...	...	...
Total	*100*	*100*	*100*	...	*100*	*100*	*100*	...
Per cent of total labor for each crop	*38.3*	*22.9*	*21.3*	*17.5*	*51.2*	*27.4*	*14.8*	*6.6*

Efficiency may also be studied in relation to that attained in other countries but unfortunately not many comparable data exist. In China in the localities studied one man-equivalent cares for 1.71 crop hectares (table 17, chapter IV) and one labor animal unit (equivalent of one ox) for farms having such units does the work required for 3.29 crop hectares (table 20, chapter IV). In the farms having one animal only, such as

TABLE 51. LABOR COST PER HECTARE AND PERCENTAGE OF LABOR COST TO ALL FARM EXPENSES

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Per cent of human labor expenses to all farm expenses	Labor cost per crop hectare†	PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Per cent of total man labor expenses to all farm expenses*	Labor cost per crop hectare†
North China			*East Central China*		
Anhwei			**Anhwei**		
Hwaiyuan	72.3	$20.28	Laian (1921)	72.0	74.85
Su	49.9	10.13	Laian (1922)	70.4	73.58
Chihli			Wuhu	74.6	74.28
Pingsiang	61.1	41.19	**Chekiang**		
Yenshan (1922)	36.5	17.83	Chinhai	50.7	110.44
Yenshan (1923)	63.0	18.33	**Fukien**		
Honan			Lienkiang	71.0	173.94
Sincheng	81.0	19.51	**Kiangsu**		
Kaifeng	74.5	20.16	Kiangning (S)	64.9	31.54
Shansi			Kiangning (T)	73.5	77.58
Wusiang	56.1	38.87	Wuchin	28.5	46.20
Wutai	79.7	17.08			
			Average by localities	*63.2*	*82.80*
Average by localities	*63.8*	*22.60*	*Average by 17 localities*	*63.5*	*50.93*

*All labor, except that of the operator, is computed as an expense.
†This includes the estimated value of the operator's labor.

one water buffalo, the median crop hectare area is 1.91; for one ox it is 1.62; for one donkey it is 1.61, and for one ox and one donkey it is 3.05 crop hectares (table 52). The data do not account for any hired or borrowed animals that might be used, and therefore must be interpreted with some caution. This is particularly true in North China, where teams of two and three animals are commonly used. Farmers who have one animal or even two animals borrow or exchange with a neighbor or relative.

In East Central China, where one animal only is used for plowing and harrowing, the area is 1.91 crop hectares for the water buffaloes, and is 1.20 for the ox, and these may be taken as the actual amount of work done per animal in that region. According to table 20, chapter IV, one labor animal unit in East Central China can care for 2.47 crop hectares,

TABLE 52. CROP HECTARE AREA (MEDIAN) PER LABOR ANIMAL AND NUMBER OF FARMS HAVING THE SPECIFIED ANIMALS ONLY*

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	One water buffalo		One ox		One donkey		One ox and one donkey	
	Number of farms	Crop hectare area	Number of farms	Crop hectare area	Number of farms	Crop hectare area	Number of farms	Crop hectare area
North China								
Anhwei								
Hwaiyuan	...	...	5	1.84	17	1.16	31	4.44
Su	...	...	8	1.62	19	0.79	32	2.65
Chihli								
Pingsiang	...	...	34	1.13	...	...	...	...
Yenshan (1922)	...	...	5	1.78	42	1.61	6	2.95
Yenshan (1923)	...	...	7	3.23	27	2.66	11	4.76
Honan								
Sincheng	...	...	27	1.69	31	1.67	21	3.14
Kaifeng	...	...	27	1.60	19	1.31	24	2.61
Shansi								
Wusiang	...	...	...	...	14	1.69	...	...
Wutai	...	...	...	...	...	...	...	...
Medians by localities	...	...	...	*1.69*	...	*1.61*	...	*3.05*
East Central China								
Anhwei								
Laian (1921)	29	3.59	...	...	...	...	...	...
Laian (1922)	35	1.77	...	...	...	...	...	...
Wuhu	29	1.38	16	1.18	...	...	...	...
Chekiang								
Chinhai	...	...	24	1.22	...	...	...	...
Fukien								
Lienkiang	...	...	79	0.86	...	...	...	...
Kiangsu								
Kiangning (S)	50	2.98	103	1.64	...	...	...	...
Kiangning (T)	16	2.05	30	1.76	...	...	...	...
Wuchin	150	1.29	21	0.65	...	...	...	...
Medians by localities	...	*1.91*	...	*1.20*	...	...	...	...
Medians by 17 localities	...	*1.91*	...	*1.62*	...	*1.61*	...	*3.05*

*The number of farms having other labor animals or other combinations of labor animals are as follows:

SU: Two donkeys, 5; one ox and one half small ox, 5; two oxen and one donkey 26; one ox, one donkey and one-half small ox, 19; one ox, one donkey and one-half small donkey, 12.

YENSHAN (1922): One and one-half donkeys, 10; one-half ox and one donkey, 7; one ox and one and one-half donkeys, 5.

YENSHAN (1923): One ox, one donkey and one-half small donkey, 5; one donkey and one-half small donkey, 6.

SINCHENG: One small ox, 6; one horse and one ox, 15; one small donkey, 6; one ox and one small donkey, 5.

KAIFENG: One ox and two donkeys, 6; one ox and two mules, 8; one horse, one ox and one donkey, 8; one ox, one donkey and one mule, 10; one ox, one donkey and two mules, 5.

WUSIANG: One mule, 5; one-half ox and one donkey, 6.

WUTAI: Two oxen, 52; two donkeys, 55; two mules, 34; two oxen and two donkeys, 8; one donkey and one mule, 22; one mule and two oxen, 14; two mules and two oxen, 5; one donkey, one mule and two oxen, 8.

LAIAN (1921): One and one-half water buffaloes, 9; two water buffaloes, 5; one water buffalo and one donkey, 7; two water buffaloes and one donkey, 6.

TABLE 52.—*(Continued)*

LAIAN (1922):	One water buffalo and one-half donkey, 14; one water buffalo and one donkey, 11.
WUHU:	One water buffalo and one ox, 8.
CHINHAI:	Three oxen, 6.
LIENKIANG:	Two oxen, 12; one water buffalo and one ox, 5.
KIANGNING (S):	Two water buffaloes, 6.

which is higher than that given for the ox partly because it is an arithmetic average number rather than a median.

A comparison of labor efficiency in China with the United States is shown in fig. 25. The much greater efficiency in the United States is the result of the attempt to save expensive labor chiefly by using more capital. In China human labor aside from land is the chief factor in agricultural production while in the United States capital investment in improved tools and farm machinery plays a very important part. China invests labor, United States capital, and this is the great difference between the agriculture of the two countries and the resulting standard of living. In China the small acreage of land per person and the limited amount of hard work that one farm laborer can do determine a small return to the farmer in the satisfactions of life.

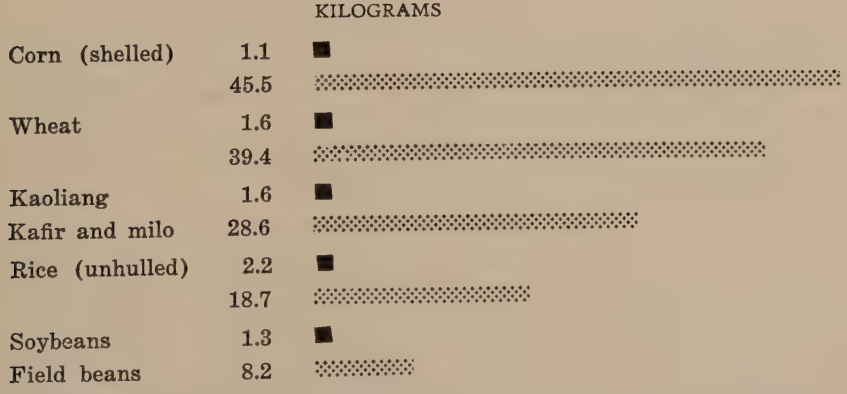

Fig. 25.—Production per hour of man labor for crops grown in China and in the United States*.

*The data for the United States are taken from the Department of Agriculture Yearbook, 1921 from the section on cost data for farm products. An exception is the yield for rice which is the 1921-1925 average and is taken from the 1928 Yearbook. The number of hours of labor for rice is from the 1922 yearbook, p. 556. The data for China are from 2866 farms, seventeen localities and seven provinces (1921-1925).

But because of the dense population, the Chinese farmer is doomed and all that can be done is to make the most out of an unfortunate situation. One way out is for the Chinese farms to produce as many crops as possible requiring much hand labor and to export these to other countries. In this way the Chinese farms can more easily compete with the machine farming of the West.

SIGNIFICANCE OF THE FARM LABOR PROBLEM

The high cost of farm labor per unit of product produced, the uneven distribution during the year of work to be done, and the small amount of work provided by the small farms are three outstanding problems connected with farming in China. Farm labor is expensive because it accomplishes little and little is accomplished because of unimproved tools and small, weak, or slow moving labor animals, and also because few animals are used per man. In East Central China a farmer carrying fertilizers to the field and crops to his threshing floor on his back is the epitome of inefficiency so far as labor is concerned. In a country where capital is so expensive, however, this apparent waste of labor may not be so great, after all. Such use of labor may be as cheap as if more land were used for roads and more capital for equipment in operation only part of the year. The importance of capital to the Chinese farmer is understood when one sees pawnshops during the winter with the hoes and plowshares and moulboards of thousands of farmers from the surrounding districts in pawn during the season when they are not being used.

Labor is so much cheaper than land or credit and it is so plentiful that it is a natural resource which the Chinese nation must learn how to use. Progress in Chinese agriculture does not depend solely, as so many think, upon the introduction of the expensive farm machinery of the West. Farm machinery can only be profitably used to the extent to which it saves labor that might otherwise be productively employed or to the extent it performs work that hand labor cannot do or cannot do as well or cannot complete quickly enough to enable farm operations to be done at the most suitable time for maximum production. Even then it will be found that much of the western machinery is wholly unadapted to conditions in

China, partly because of the small farms and tiny fields and the different farm practices and party because of its expensiveness.

Costs of machinery include depreciation, interest on the money invested, and repairs and risk, and all these together vary approximately from 20-50 per cent of the original cost depending on the type of machine and the kind of use and its care.

Thus a tractor costing $2300 (Chinese currency) would have yearly costs amounting to $832 when depreciation is calculated at 20 per cent, interest at 8 per cent, repairs at 5 per cent, and risk at 2.5 per cent. Similarly the costs on a two gang tractor plow having an initial value of $300 Chinese currency, but where the depreciation is computed at 10 per cent, would be approximately $77.00.

To compute the cost of tractor plowing at the lowest possible amount, it may be assumed that the tractor is owned cooperatively or by a person or group of persons doing custom work, and that one-fourth of the operating time of the tractor is for other purposes than plowing. Thus the tractor yearly costs would be $208 and that of the gang plow $77 or a total of $285. If it is estimated that plowing is possible for 30 full days in the year and that two hectares are plowed per day then a total of 60 hectares might be plowed in one year at a cost of $4.75 per hectare for the non-recurring expenses.

Operating costs may be estimated at $3.78 per hectare for seven gallons of kerosene, $1.40 per hectare for 0.4 of a gallon of lubricating oil, and 50 cts. per hectare for labor, or a total of $5.68 per hectare for operating expenses. The total of yearly and operating costs would then amount to $10.43 per hectare. These may be compared with that of approximately $4.00 per hectare for plowing with a water buffalo. A tractor, then, even in regions where the fields are large enough, must be able to do enough better work, such as plowing more deeply and more nearly in season, to increase present production to the value of over $6.43 per hectare if it is to compete successfully with the ox or the water buffalo.

The threshing machine apparently has a better chance of success than the tractor. Cost data on the small machine used at the University of Nanking show that it can thresh as cheaply

as the flail and at the same time turn out a clean product even though the machine is used only fifteen days in the year; such cost is 54 cents per 133 1/3 pounds compared with 55 cents for a flail. But as with so many introductions, a difficulty arises in that the straw, which is much used for thatching, is not kept straight and stiff as with a flail. The threshing machine, however, saves labor at a time when it is needed for other work.

The oil engine is an example of a machine successfully and increasingly used in the lower Yangtze valley for irrigation and sometimes for drainage purposes. The water requirements for rice are so great that for those regions where water is not near that field level, human power is utterly inadequate.

Other examples might be cited, pro and con. But let it be remembered that often the cheapest way is to reduce labor during present busy seasons by diversifying farming which in turn better distributes the labor and requires less hired labor.

The labor problem in China, however, is not primarily one of reducing labor on the farm so much as one of finding more work on profitable enterprises, since at present most farmers are only fully employed a small part of the year. The enlargement of the farm business by more intensive farming, as discussed at the end of chapter IV, should help to utilize farm labor more fully.

LITERATURE CITED

[1] Buck, J. Lossing. An economic and social survey of 150 farms, Yenshan Hsien, Chihli Province, China. University of Nanking. P. 49.

CHAPTER IX

THE FARM FAMILY AND POPULATION

Population affects fundamentally every phase of the economic life of a nation and this is nowhere more true than in rural districts. There density determines farm practice, which in turn depends upon the abundance or scarcity of labor; it sets the standards of living high or low since upon the number of those who must share the given amount of produce rests the satisfaction and comfort of all; it even concerns the peace and order of the countryside, for if there are more men than can find employment, banditry may increase. In any study of rural life, therefore, the question of population has a place.

COMPOSITION OF THE FARM FAMILY

The farm family in China, generally speaking, is of the "large family" type; that is, in addition to the marriage-group composed of the male head, his wife, and their children, there are other relatives of the male head who live and eat in his household. Such relatives are his mother, brothers, married sons and their wives and their children, and many others, comprising in all a possibility of thirty-two various relationships.[1]

Besides these, there are other relatives who do not live in the household, but who may be termed members of the "economic family" because they share the family budget. There are in all six generations living together, two preceding and three succeeding the generation of the existing head.

The number of different relatives, while small per individual family, is great for the whole group of 2640 families (table 1).

Sixty-four per cent of all families are of the "larger family" type and the relatives of these "larger families," excluding those in the marriage-group of the male head, bear to the total population a proportion of 45.3 per cent. Of these relatives, daughters-in-law live in nearly one-third of all families—a proportion larger than for any other type of relations; mothers

[1] The Chinese do not use the term relative (親戚) except for those related through the male line.

TABLE 1. COMPOSITION OF FARM FAMILIES BY PERCENTAGE OF THE TOTAL FAMILIES HAVING MEMBERS OF SPECIFIED RELATIONSHIP TO THE MALE HEAD (LIVING OR DECEASED) IN THE DESIGNATED GENERATION

2640 farm families, 16 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Per cent of "large families" to total families	Generation of the head of the family										First generation preceding that of the head of the family						Second generation preceding that of the head of the family				
		Male heads	Wives	Brothers	Sisters		Brothers-in-law	Sisters-in-law		First cousins		Mothers of sons' wives	Fathers	Fathers-in-law	Mothers	Mothers-in-law	Uncles	Aunts	Grandmothers		Grandfathers		Grandmother-in-law
					Married	Unmarried	Sisters' husbands	Brothers' wives	Wife's sisters	Father's brothers' sons	Mother's brothers' sons						Father's brothers	Paternal	Maternal	Paternal	Father's cousins' fathers	
North China																						
Anhwei																						
Hwaiyuan	66.9	97.6	79.0	14.5	...	0.8	...	8.1	...	...	...	0.8	4.8	0.8	28.2	...	0.8	...	0.8	...	...	...	...
Su	67.1	99.3	87.8	21.7	...	2.8	...	16.4	...	0.3	...	...	6.3	...	17.5	...	0.7	0.3	1.0	...	...	...	...
Chihli																						
Pingsiang	50.0	98.0	71.1	13.8	...	4.6	...	8.6	...	...	...	...	7.9	...	27.6	...	...	...	1.3	0.7	...	...	...
Yenshan (1922)	57.9	98.7	80.6	11.3	...	2.7	...	12.7	...	...	...	...	8.7	...	29.3	...	...	...	2.0	...	...	...	...
Yenshan (1923)	59.3	91.0	77.4	9.0	...	4.5	...	6.0	...	...	...	...	3.0	...	24.8	...	...	...	2.3	...	0.8	...	0.8
Honan																						
Sincheng	79.2	100.0	85.4	18.1	2.1	2.1	0.7	16.7	...	...	...	...	7.0	...	31.3	...	...	...	...	...	...	...	...
Kaifeng	85.2	100.0	92.6	16.1	...	4.0	...	11.4	...	...	...	...	4.7	...	25.5	...	...	...	0.7	...	...	...	...
Shansi																						
Wusiang	55.8	96.8	81.3	8.8	...	2.4	...	5.6	...	...	...	...	...	...	17.1	...	0.4	1.6	0.8	...	...	...	...
Weighted average	*64.7*	*97.8*	*82.5*	*14.5*	*0.2*	*3.0*	*0.1*	*10.9*	...	*0.1*	...	*0.1*	*5.0*	*0.1*	*23.8*	...	*0.3*	*0.4*	*1.1*	*0.1*	*0.1*	...	*0.1*
East Central China																						
Anhwei																						
Laian (1921)	75.0	100.0	82.2	35.6	...	6.9	...	26.7	...	...	...	...	5.0	...	23.8	...	...	...	...	...	...	...	...
Laian (1922)	77.2	100.0	100.0	31.0	1.0	6.0	1.0	27.0	...	...	...	...	1.0	...	5.0	...	...	1.0	...	...	...	...	...
Wuhu	59.8	100.0	78.4	11.8	...	2.0	...	11.8	...	...	...	...	...	...	12.7	...	...	...	...	...	...	...	...
Chekiang																						
Chinhai	37.3	100.0	91.0	...	...	...	...	...	...	...	1.5	...	9.0	...	23.9	...	...	...	...	...	...	...	...
Fukien																						
Lienkiang	62.1	99.4	93.8	18.6	...	1.9	...	5.9	...	...	...	...	1.9	...	27.3	...	...	...	...	...	...	...	...
Kiangsu																						
Kiangning (S)	75.4	93.6	95.1	5.4	...	1.0	...	4.4	...	...	...	...	...	...	28.6	...	...	...	0.5	...	...	...	...
Kiangning (T)	65.4	98.2	85.7	16.6	...	5.5	...	13.8	0.5	...	...	...	0.5	0.5	19.4	1.8	3.2	...	...	...	...	...	...
Wuchin	51.7	100.0	87.7	11.7	0.3	4.7	0.3	4.7	...	...	...	...	3.3	...	25.0	...	...	0.3	1.0	...	...	0.3	...
Weighted average	*64.1*	*98.6*	*89.3*	*15.3*	*0.2*	*3.7*	*0.2*	*10.3*	*0.1*	...	*0.1*	...	*2.1*	*0.1*	*22.1*	*0.3*	*0.6*	*0.2*	*0.3*	...	...	*0.1*	...
Weighted average, 16 localities	*63.9*	*98.2*	*85.7*	*14.9*	*0.2*	*3.3*	*0.1*	*10.6*	—	—	—	—	*3.6*	*0.1*	*23.0*	*0.2*	*0.4*	*0.3*	*0.7*	—	—	—	—

TABLE 1.—*(Continued)*

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	FIRST GENERATION SUCCEEDING THAT OF THE HEAD OF THE FAMILY														SECOND GENERATION SUCCEEDING THAT OF THE HEAD OF THE FAMILY									THIRD GENERATION SUCCEEDING THAT OF THE HEAD OF FAMILY	
	Sons		Sons adopted	Daughters		Daughters-in-law		Sons-in-law	Nephews		Nieces			Financées of sons	Grandsons		Granddaughters		Granddaughters-in-law	Grandnephews	Grandnieces	Financées of sons' sons		Grandson's sons	Grandson's daughters
	Married	Unmarried		Married	Unmarried	Sons' wives	Sons' wives' sisters	Daughters' husbands	Brothers' sons	Sisters' sons	Brothers' daughters	Brothers' sons' wives	Sisters' daughters		Sons' sons	Daughters' sons	Sons' daughters	Daughters' daughters	Sons' sons' wives	Brothers' grandsons	Brothers' granddaughtres		Great-grandsons	Great-granddaughters
North China																									
Anhwei																									
Hwaiyuan	24.2	58.9	1.6	...	42.7	27.4	0.8	...	8.9	...	4.8	1.6	...	...	12.1	...	10.5	...	...	...	...	...	...	...
Su	35.7	53.8	...	0.3	46.2	38.1	...	...	10.8	...	7.7	3.1	...	...	25.2	...	15.4	0.3	1.0	1.0	0.3	...	0.3	...
Chihli																									
Pingsiang	9.2	47.4	...	0.7	44.1	11.8	...	0.7	7.2	...	3.9	...	...	...	7.9	0.7	3.9	...	0.7	...	...	...	...	...
Yenshan (1922) ..	22.7	51.3	...	...	44.7	26.7	...	...	5.3	...	4.7	...	...	...	17.3	...	15.3	...	1.3	...	...	...	0.7	...
Yenshan (1923) ..	22.6	43.6	...	...	51.9	29.3	...	...	2.3	1.5	1.5	1.5	...	...	21.8	...	12.8	...	0.8	...	...	...	...	...
Honan																									
Sincheng	43.8	59.7	...	...	43.1	45.1	...	...	11.1	0.7	6.3	2.8	0.7	...	29.2	...	21.5	...	2.8	1.4	1.4	...	...	0.7
Kaifeng	53.7	64.4	...	...	55.7	53.7	...	...	8.7	...	6.7	0.7	...	...	38.9	...	38.9	...	1.3	0.7	...	...	0.7	...
Shansi																									
Wusiang	17.9	51.0	...	...	42.6	30.3	...	...	4.0	...	3.6	0.8	...	0.4	10.8	...	8.0	...	0.4	...	...	0.4	0.4	0.4
Weighted average ..	*28.7*	*53.9*	*0.1*	*0.1*	*46.1*	*33.2*	*0.1*	*0.1*	*7.4*	*0.2*	*5.1*	*1.4*	*0.1*	*0.1*	*20.2*	*0.1*	*15.3*	*0.1*	*1.0*	*0.4*	*0.2*	*0.1*	*0.3*	*0.1*
East Central China																									
Anhwei																									
Laian (1921) ..	29.7	58.4	...	...	31.7	29.7	...	1.0	8.9	...	1.0	...	...	...	14.9	...	2.0	...	...	...	...	...	...	...
Laian (1922) ..	36.0	62.0	...	...	44.0	36.0	...	...	12.0	...	14.0	...	...	...	17.0	...	9.0	...	...	...	...	...	...	...
Wuhu	38.2	63.7	...	...	32.4	36.3	...	...	8.8	...	4.9	2.0	...	...	26.3	...	14.7	...	...	...	...	...	...	...
Chekiang																									
Chinhai	9.0	89.6	...	...	71.6	9.0	...	...	...	...	...	...	...	...	4.5	...	3.0	...	...	...	...	...	...	...
Fukien																									
Lienkiang	26.1	75.8	...	...	36.0	26.7	...	...	3.1	...	1.2	...	...	...	12.4	...	5.6	...	0.6	...	...	...	...	...
Kiangsu																									
Kiangning (S) ..	28.6	65.0	...	...	71.4	46.8	...	...	3.9	...	1.5	...	...	...	32.0	...	19.7	...	0.5	...	...	...	...	...
Kiangning (T) ..	25.3	70.0	...	0.5	82.9	25.8	...	0.9	16.6	0.5	11.5	2.8	...	...	14.3	...	15.2	0.5	0.5	1.8	0.9	...	0.5	...
Wuchin	17.0	65.0	...	0.3	56.0	18.0	...	0.3	5.0	1.3	2.0	...	...	2.3	7.0	...	5.3	...	...	...	...	0.3	...	...
Weighted average ..	*25.3*	*67.7*	...	*0.2*	*56.6*	*28.5*	...	*0.3*	*7.5*	*0.4*	*4.6*	*0.6*	...	*0.6*	*15.9*	...	*10.1*	*0.1*	*0.2*	*0.3*	*0.2*	*0.1*	*0.1*	—
Weighted average, 16 localities ..	*27.1*	*60.4*	*0.1*	*0.2*	*51.1*	*30.9*	—	*0.2*	*7.5*	*0.3*	*4.8*	*1.1*	—	*0.3*	*18.2*	—	*12.8*	*0.1*	*0.6*	*0.4*	*0.2*	*0.1*	*0.2*	*0.1*

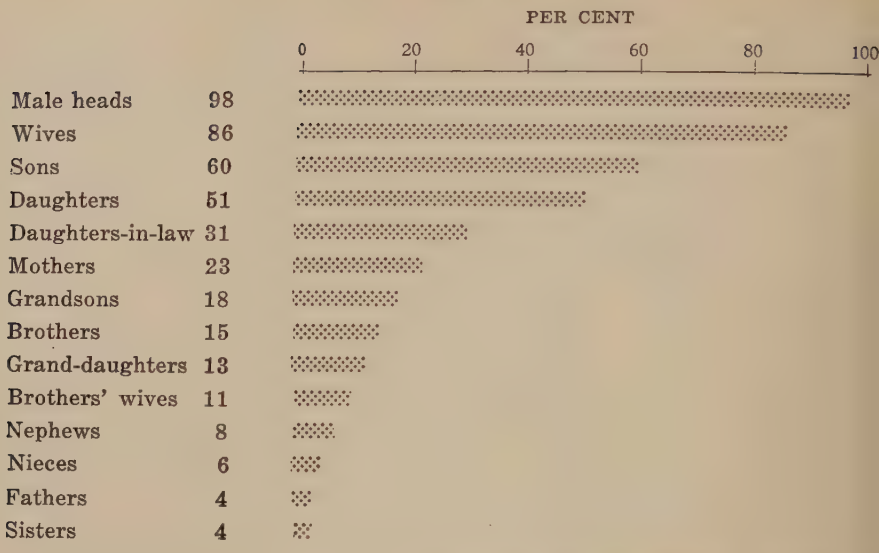

Fig. 1.—Proportion of all families having the specified relative to the male head.*

2640 families, 16 localities, seven provinces, China (1921-1925).

*All other relatives occur in less than one per cent of all families.

are second, and live with over one-fifth, and fathers with only 3.6 per cent of all families. The proportion of families containing the various relatives is graphically represented in fig. 1.

Another way to picture the extent to which different relatives are found in the family is by the proportion they form to the total population (table 2). Male heads constitute 17.3 and their wives 15.2 per cent of the total population. Unmarried sons form 15.6 and married sons 6.4 per cent of the total population. Thirteen per cent consist of unmarried daughters; practically all of the married daughters have, of course, left the home. Daughters-in-law (sons' wives) have the next largest percentage, amounting to 7.7; then grandsons, 5.3 per cent; mothers, 4.1 per cent ; grand-daughters (sons' daughters), 3.4 per cent; brothers, 3.4 per cent; sisters-in-law (brothers' wives), 2.5 per cent; nephews (brothers' sons), 2.3 per cent; and nieces (brothers' daughters), 1.3 per cent. All the remaining relatives constitute less than one per cent each of the population.

There are a number of widowers among the male heads, shown by the fact that while 98.2 per cent of all families have male heads, only 85.7 per cent of all families have wives of these

TABLE 2. NUMBER AND PERCENTAGE OF MEMBERS OF FARM FAMILIES OF SPECIFIED RELATIONSHIP TO THE MALE HEAD (LIVING OR DECEASED) IN THE DESIGNATED GENERATION

2640 farm families, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Generation of the head of the family											First generation preceding that of the head of the family						Second generation preceding that of the head of the family				
				Sisters		Sisters-in-law			First cousins										Grand mothers		Grand fathers		
	Male heads	Wives	Brothers	Married	Unmarried	Brothers' wives	Wife's sisters	Brothers-in-law (sisters' husbands)	Father's brothers' sons	Mother's bro's. sons	Mothers of sons' wives	Mothers	Mothers-in-law	Fathers	Fathers-in-law	Uncles	Aunts father's (brothers' wives)	Paternal	Maternal	Paternal	Fathers cousins' fathers	Grand-mothers-in-law
North China																						
Anhwei																						
Hwaiyuan	121	98	23	...	1	12	...	...	...	...	1	35	...	6	1	1	...	1	...	...	...	...
Su	284	251	94	...	9	76	...	...	3	...	...	50	...	18	...	2	1	3	...	...	...	...
Chihli																						
Pingsiang	149	110	22	...	14	15	...	...	...	...	...	43	...	12	...	...	...	2	1	...	...	...
Yenshan (1922)	148	122	20	...	7	19	...	...	...	...	...	44	...	13	...	...	...	3	...	...	...	...
Yenshan (1923)	121	104	14	...	6	8	...	...	...	...	...	34	...	4	...	...	...	3	...	1	...	1
Honan																						
Sincheng	144	123	37	3	6	35	...	1	...	...	...	45	...	10	...	...	...	...	...	...	...	...
Kaifeng	149	139	31	...	6	22	...	...	...	...	...	38	...	7	...	...	...	1	...	...	...	...
Shansi																						
Wusiang	243	205	24	...	10	22	...	...	...	...	...	43	...	...	...	1	4	2	...	...	...	...
Total	*1359*	*1152*	*265*	*3*	*59*	*209*	...	*1*	*3*	...	*1*	*332*	...	*70*	*1*	*4*	*5*	*15*	*1*	*1*	...	*1*
Per cent	*16.9*	*14.3*	*3.3*	--	*0.7*	*2.6*	...	—	—	...	—	*4.1*	...	*0.9*	—	*0.1*	*0.1*	*0.2*	—	—	...	—
East Central China																						
Anhwei																						
Laian (1921)	101	83	48	...	9	34	...	...	...	...	...	24	...	5	...	...	...	...	...	...	...	...
Laian (1922)	100	101	39	1	6	29	...	1	...	...	...	5	...	1	...	...	1	...	...	...	...	...
Wuhu	102	80	21	...	2	20	...	...	...	...	...	13	...	...	...	...	...	...	...	...	...	...
Chekiang																						
Chinhai	67	61	...	...	...	...	...	...	...	1	...	16	...	6	...	...	...	...	...	...	...	...
Fukien																						
Lienkiang	160	151	33	...	3	9	...	...	...	...	...	44	...	3	...	...	...	...	...	...	...	...
Kiangsu																						
Kiangning (S)	190	193	19	...	2	14	...	...	...	...	...	58	...	...	...	...	...	1	...	...	...	...
Kiangning (T)	213	186	41	...	13	35	2	...	...	...	...	42	4	1	1	7	...	...	...	...	...	...
Wuchin	300	265	45	1	14	18	...	1	...	...	...	75	...	10	...	...	1	3	...	...	1	...
Total	*1233*	*1120*	*246*	*2*	*49*	*159*	*2*	*2*	...	*1*	...	*277*	*4*	*26*	*1*	*7*	*2*	*4*	...	...	*1*	...
Per cent	*17.8*	*16.2*	*3.6*	—	*0.7*	*2.3*	—	—	...	—	...	*4.0*	*0.1*	*0.4*	—	*0.1*	—	*0.1*	...	...	—	...
Total, 16 localities	*2592*	*2272*	*511*	*5*	*108*	*368*	*2*	*3*	*3*	*1*	*1*	*609*	*4*	*96*	*2*	*11*	*7*	*19*	*1*	*1*	*1*	*1*
Per cent, 16 localities	*17.3*	*15.2*	*3.4*	—	*0.7*	*2.5*	—	—	—	—	—	*4.1*	—	*0.7*	—	*0.1*	*0.1*	*0.1*	—	—	—	—

TABLE 2.—*(Continued)*

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	First generation succeeding that of the head of the family														Second generation succeeding that of the head of the family								Third generation succeeding that of the head of the family	
	Sons		Sons adopted	Daughters		Daughters-in-law		Nephews		Nieces			Fiancees of sons		Grand sons		Grand daughters		Grand-daughters-in-law (sons sons' wives)	Grand-nephews (brothers' grand sons)	Grand-nieces (brothers' grand-daughters)	Fiancees of sons' sons	Great grand sons (grand sons' sons)	great grand-daughters grand-daughters' sons
	Married	Unmarried		Married	Unmarried	Sons' wives	Sons' wives' sister	Sons-in-law (daughters' husbands)	Brothers' sons	Sisters' sons	Brothers' daughters	Brothers sons' wives	Sisters' daughters		Sons' sons	Daughters' sons	Sons' daughters	Daughters' daughters						
North China																								
Anhwei																								
Hwaiyuan	34	119	2	...	71	44	1	...	19	...	7	2	...	...	30	...	16	...	...	...	...	...	...	...
Su	168	242	...	1	194	178	...	...	80	...	36	15	...	...	138	...	72	1	5	7	3	...	1	...
Chihli																								
Pingsiang	16	105	...	1	95	22	...	1	17	...	8	...	...	...	26	2	13	...	1	...	...	...	...	...
Yenshan (1922) ..	42	108	...	...	106	54	...	...	8	...	10	...	...	...	50	...	46	...	2	...	...	...	1	...
Yenshan (1923) ..	36	92	...	...	114	59	...	...	5	2	2	2	...	...	46	...	32	...	1	...	...	...	...	...
Honan																								
Sincheng	88	143	...	...	88	96	...	...	31	1	21	7	1	...	73	...	38	...	4	5	3	...	...	1
Kaifeng	116	146	...	...	139	119	...	...	16	...	19	1	...	...	113	...	100	...	2	1	...	...	1	...
Shansi																								
Wusiang	52	183	...	...	137	101	...	...	17	...	9	4	...	1	43	...	26	...	2	...	...	1	1	1
Total	*552*	*1138*	*2*	*2*	*944*	*673*	*1*	*1*	*193*	*3*	*112*	*31*	*1*	*1*	*514*	*2*	*343*	*1*	*17*	*13*	*6*	*1*	*4*	*2*
Per cent	*6.9*	*14.2*	—	—	*11.8*	*8.4*	—	—	*2.4*	—	*1.4*	*0.4*	—	—	*6.4*	—	*4.3*	—	*0.2*	*0.2*	*0.1*	—	*0.1*	—
East Central China																								
Anhwei																								
Laian (1921) ..	43	84	...	...	36	43	...	1	16	...	1	...	...	...	29	...	2	...	...	...	...	...	...	...
Laian (1922) ..	43	78	...	...	51	43	...	...	18	...	20	...	...	...	25	...	10	...	...	...	...	...	...	...
Wuhu	56	92	...	...	41	54	...	...	12	...	10	3	...	...	40	...	22	...	...	...	...	...	...	...
Chekiang																								
Chinhai	6	111	...	...	68	6	...	...	...	...	...	...	...	...	4	...	2	...	...	...	...	...	...	...
Fukien																								
Lienkiang	54	180	...	...	66	55	...	...	5	...	2	...	...	...	32	...	10	...	1	...	...	...	...	...
Kiangsu																								
Kiangning (S) ..	67	163	...	...	185	132	...	...	12	...	6	...	...	...	83	...	45	...	1	...	...	...	...	...
Kiangning (T) ..	71	214	...	1	304	73	...	2	66	1	39	9	...	...	39	...	47	2	1	7	3	...	1	...
Wuchin	65	265	...	1	238	70	...	1	18	6	6	...	...	8	31	...	18	...	...	...	...	1	...	...
Total	*405*	*1187*	...	*2*	*989*	*476*	...	*4*	*147*	*7*	*84*	*12*	...	*8*	*283*	...	*156*	*2*	*3*	*7*	*3*	*1*	*1*	...
Per cent	*5.8*	*17.2*	...	—	*14.3*	*6.9*	...	*0.1*	*2.1*	*0.1*	*1.2*	*0.2*	...	*0.1*	*4.1*	...	*2.3*	—	*0.1*	*0.1*	*0.1*	—	—	...
Total, 16 localities ..	*957*	*2325*	*2*	*4*	*1933*	*1149*	*1*	*5*	*340*	*10*	*196*	*43*	*1*	*9*	*797*	*2*	*499*	*3*	*20*	*20*	*9*	*2*	*5*	*2*
Per cent, 16 localities	*6.4*	*15.6*	—	—	*13.0*	*7.7*	—	—	*2.3*	*0.1*	*1.3*	*0.3*	—	*0.1*	*5.3*	—	*3.4*	—	*0.1*	*0.1*	*0.1*	—	—	—

heads. During the second and third decades the death rate among married women is higher than among men and is probably caused largely by tetanus infection at childbirth. There may also be a higher proportion of suicides during these ages than at any other time. Then after middle age the death rate among men becomes higher than among women due to the biologically higher death rate among men for these ages. That there are a large number of widows is plain from the fact that mothers of the head are six times the number of fathers. Fathers at this age are not often working away from home.

The custom of sons remaining in the family after marriage accounts for the large number of mothers living with the heads of the family. If the father dies before the mother, then the son usually becomes the head of the family, although the mother, of course, still lives with him. The large number of married sons is also the result of this custom of sons remaining with parents after marriage. This, together with the custom of daughters leaving the parents after marriage, widens the gap between the number of sons and daughters in the family.

The custom of rearing the fiancèe of the son or grandson in the family of the person to whom she is betrothed was reported for only three localities and occurred in only 11 out of the total of 2640 families. As a rule, the better families do not adopt this custom.

The average age of each type of relative reveals a number of interesting conditions (table 3). Wives of male heads are younger than their husbands and widowed male heads; this is shown by the average age of 42.5 years for male heads and of 40 years for living wives. Married sons are 26.4 years old, compared with 25.5 years for their wives, and with 10.1 for unmarried sons and 9.1 for unmarried daughters. Brothers of the head of the family are younger brothers as is shown by their average age of 27.7. Mothers average 59, fathers 63.9, and grandmothers 74.6 years. Brothers' sons average 10.7, grandsons 6.2, and grand-daughters 5.2 years. The fiancèes of sons average 14.1 years and those of the grandsons (sons' sons) 11 years.

The actual average age of marriage of 2330 family heads is 19.7 years, while that of their living wives is 17.9 years (table 4). Averages for North and East Central China are

TABLE 3. AGE OF FAMILY MEMBERS OF SPECIFIED RELATIONSHIP TO THE MALE HEAD (LIVING OR DECEASED) IN THE DESIGNATED GENERATION

2640 farm families, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	GENERATION OF THE HEAD OF THE FAMILY											FIRST GENERATION PRECEDING THAT OF THE HEAD OF THE FAMILY							SECOND GENERATION PRECEDING THAT OF THE HEAD OF THE FAMILY				
	Male heads	Wives	Brothers	Sisters		Brothers-in-law First cousins			Sisters-in-law		Mothers of sons' wives	Fathers	Fathers-in-law	Mothers	Mothers-in-law	Uncles	Aunts	Grand fathers		Grand mothers		Grand mothers' in-law
				Married	Unmarried	Sisters' husbands	Fathers' brothers' sons	Mothers' brothers' sons	Brothers' wives	Wife's sisters							Fathers' brothers' wives	Paternal	Father's brother's father	Paternal	Maternal	
North China																						
Anhwei																						
Hwaiyuan	41.2	38.9	21.8	...	18.0	...	...	...	34.9	...	55.0	64.7	57.0	54.3	...	79.0	...	...	...	79.0	...	...
Su	44.4	41.4	32.5	...	14.4	...	8.3	...	33.5	...	...	62.4	...	59.1	...	63.0	44.0	...	...	78.8	...	...
Chihli																						
Pingsiang	41.9	42.4	28.9	...	11.6	...	...	...	33.7	...	...	62.7	...	56.7	...	...	...	...	...	57.0	64.0	...
Yenshan (1922)	42.0	38.5	26.8	...	12.4	...	...	...	26.9	...	...	64.8	...	62.7	...	...	...	...	...	77.7	...	...
Yenshan (1923)	45.5	42.6	19.8	...	14.2	...	...	...	29.5	...	...	68.5	...	59.3	...	...	...	87.0	...	77.0	...	95.0
Honan																						
Sincheng	46.7	43.9	32.4	49.0	12.3	29.0	...	...	32.9	...	...	70.1	...	62.8	...	...	...	...	...	...	...	...
Kaifeng	46.6	45.1	26.5	...	13.7	...	...	...	28.3	...	...	69.3	...	61.4	...	...	...	...	...	74.0	...	...
Shansi																						
Wusiang	44.2	39.5	28.2	...	10.8	...	...	...	30.0	...	...	...	...	61.2	...	59.0	62.8	...	...	74.5	...	...
*Weighted average**	*44.2*	*41.5*	*29.1*	*49.0*	*12.6*	*29.0*	*8.3*	...	*31.8*	...	*55.0*	*65.2*	*57.0*	*59.8*	...	*66.0*	*59.0*	*87.0*	...	*74.4*	*64.0*	*95.0*
East Central China																						
Anhwei																						
Laian (1921)	38.6	35.1	23.3	...	15.1	...	...	...	24.9	...	...	57.4	...	57.6	...	...	...	...	...	...	...	...
Laian (1922)	44.6	44.1	30.2	20.0	18.3	25.0	...	...	32.1	...	...	47.0	...	59.4	...	...	55.0	...	...	...	...	...
Wuhu	42.2	37.2	31.5	...	11.5	...	...	...	31.9	...	...	...	...	53.8	...	...	...	...	...	...	...	...
Chekiang																						
Chinhai	39.0	36.4	...	...	...	...	...	7.0	...	...	...	65.7	...	62.9	...	...	...	...	...	...	...	...
Fukien																						
Lienkiang	36.7	34.3	23.1	...	16.0	...	...	...	28.1	...	...	64.7	...	57.6	...	...	...	...	...	...	...	...
Kiangsu																						
Kiangning (S)	42.9	41.3	29.4	...	16.0	...	...	...	31.6	...	...	...	...	57.2	...	...	...	...	...	78.0	...	...
Kiangning (T)	43.7	40.0	29.4	...	13.1	...	...	...	34.4	13.0	...	63.0	57.0	57.9	54.8	53.9	...	...	...	...	...	...
Wuchin	38.8	37.5	21.0	33.0	15.7	32.0	...	...	31.7	...	...	58.5	...	58.7	...	...	50.0	...	64.0	74.7	...	...
*Weighted average**	*40.8*	*38.5*	*26.1*	*26.5*	*15.2*	*28.5*	...	*7.0*	*30.7*	*13.0*	...	*60.4*	*57.0*	*58.0*	*54.8*	*53.9*	*52.5*	...	*64.0*	*75.5*	...	...
***Weighted average,* 16 localities**	*42.5*	*40.0*	*27.7*	*40.0*	*13.8*	*28.7*	*8.3*	*7.0*	*31.4*	*13.0*	*55.0*	*63.9*	*57.0*	*59.0*	*54.8*	*53.3*	*57.1*	*87.0*	*64.0*	*74.6*	*64.0*	*95.0*

TABLE 3.—*(Continued)*

Provinces and hsiens in which studies were made	First generation succeeding that of the head of the family														Second generation succeeding that of head of the family									Third generation succeeding that of the head of the family	
	Sons		Sons adopted	Daughters		Daughters-in-law		Sons-in-law	Nephews		Nieces			Fiancees of sons	Grandsons		Granddaughters		Grand-daughters-in-law (sons' sons' wives)	Grand-nephews (brothers' grand sons)	Grand-nieces (brother's grand-daughters)	Fiancees of sons' sons	Great-grandsons (grandsons' sons)	Great grand-daughters (grand sons' daughters)
	Married	Unmarried		Married	Unmarried	Sons' wives	Sons' wives' sisters	Daughters' husbands	Brothers' sons	Sisters' sons	Brothers' daughters	Brothers' sons' wives	Sisters' daughters		Sons' sons	Daughters' sons	Sons' daughters	Daughters' daughters						
North China																								
Anhwei																								
Hwaiyuan	24.3	9.5	15.0	...	8.8	23.5	14.0	...	12.9	...	5.7	20.5	...	...	6.2	...	6.6	...	...	...	...	...	...	...
Su	26.8	10.6	...	15.0	8.5	25.8	...	...	13.4	...	6.9	23.6	...	...	7.3	...	4.2	23.0	20.2	4.6	9.7	...	2.0	...
Chihli																								
Pingsiang	27.2	11.3	...	23.0	8.4	29.4	...	21.0	5.1	...	5.9	...	...	...	7.2	2.0	5.4	...	10.0	...	...	...	...	...
Yenshan (1922) ..	29.6	9.0	...	...	8.6	28.4	...	...	5.3	...	8.0	...	...	...	8.7	...	9.3	...	19.0	...	...	...	1.0	...
Yenshan (1923) ..	28.1	9.6	...	...	10.0	28.2	...	...	12.8	15.0	10.5	20.0	...	...	6.2	...	6.9	...	28.0	...	...	...	...	...
Honan																								
Sincheng	27.5	11.9	...	...	9.5	26.8	...	...	11.9	5.0	8.7	22.9	6.0	...	7.2	...	5.6	...	20.0	12.0	7.3	...	...	3.0
Kaifeng	27.3	9.8	...	...	9.8	27.1	...	...	5.9	...	3.6	23.0	...	...	6.3	...	5.2	...	18.0	1.0	...	...	—	...
Shansi																								
Wusiang	26.0	8.7	...	...	8.4	22.7	...	...	9.6	...	7.3	19.5	...	17.0	6.7	...	5.2	...	29.5	...	...	12.0	17.0	8.0
*Weighted average** .	*27.0*	*10.1*	*15.0*	*19.0*	*9.0*	*26.1*	*14.0*	*21.0*	*11.1*	*11.7*	*6.8*	*22.5*	*6.0*	*17.0*	*7.0*	*2.0*	*5.9*	*23.0*	*21.2*	*7.2*	*8.5*	*12.0*	*5.0*	*5.5*
East Central China																								
Anhwei																								
Laian (1921) ..	26.0	9.3	...	...	8.8	25.0	...	17.0	4.6	...	3.0	...	...	...	2.6	...	3.0	...	...	...	...	...	...	...
Laian (1922) ..	26.5	11.7	...	...	10.6	26.5	...	...	9.2	...	4.8	...	...	...	3.9	...	2.1	...	...	...	...	...	...	...
Wuhu	25.9	10.3	...	...	5.3	24.7	...	...	11.3	...	5.5	20.3	...	...	5.7	...	5.1	...	...	...	...	...	...	...
Chekiang																								
Chinhai	28.3	9.8	...	...	8.6	26.5	...	...	...	...	...	...	...	...	6.0	...	2.0	...	...	...	...	...	...	...
Fukien																								
Lienkiang	24.1	10.6	...	...	8.8	23.0	...	...	6.6	...	3.5	...	...	...	7.1	...	4.1	...	19.0	...	...	...	...	...
Kiangsu																								
Kiangning (S) ..	27.6	10.1	...	...	10.0	26.2	...	...	7.0	...	4.5	...	...	...	4.7	...	3.6	...	20.0	...	...	...	...	...
Kiangning (T) ..	24.0	10.3	...	26.0	9.4	22.2	...	23.5	12.6	—	7.7	23.1	...	...	5.6	...	3.1	4.0	20.0	6.9	3.0	...	1.0	...
Wuchin	24.7	10.0	...	20.0	9.5	24.4	...	21.0	10.6	7.0	8.7	...	...	13.8	4.0	...	2.9	...	...	...	...	10.0	...	...
*Weighted average**	*25.5*	*10.2*	...	*23.0*	*9.3*	*24.7*	...	*21.3*	*10.3*	*6.0*	*6.5*	*19.7*	...	*13.8*	*4.9*	...	*3.9*	*4.0*	*19.7*	*6.9*	*3.0*	*10.0*	*1.0*	...
Weighted average, 16 localities* ..	*26.4*	*10.1*	*15.0*	*21.0*	*9.1*	*25.5*	*14.0*	*21.2*	*10.7*	*7.7*	*6.6*	*21.6*	*6.0*	*14.1*	*6.2*	*2.0*	*5.2*	*10.3*	*21.0*	*7.1*	*6.7*	*11.0*	*4.2*	*5.5*

*The average age of the total population is 25.7 years.

TABLE 4. AGES OF MARRIAGE FOR THE HEAD OF THE FAMILY AND FOR HIS WIFE

2330 farm families, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Age of		Provinces and hsiens in which studies were made	Age of	
	Family head	Wife		Family head	Wife
North China			*East Central China*		
Anhwei			**Anhwei**		
Hwaiyuan	20.7	17.9	Laian (1921)	18.1	16.1
Su	19.8	18.7	Laian (1922)	18.7	18.6
			Wuhu	20.4	18.6
Chihli			**Chekiang**		
Pingsiang	18.8	17.9	Chinhai	21.7	20.0
Yenshan (1922)	18.6	17.0	**Fukien**		
Yenshan (1923)	19.3	17.4	Lienkiang	20.2	17.9
Honan			**Kiangsu**		
Sincheng	20.3	18.6	Kiangning (S)	20.5	18.8
Kaifeng	18.9	18.1	Kiangning (T)	19.3	16.6
Shansi			Wuchin	20.3	19.0
Wusiang	20.8	16.9			
Wutai	18.5	16.6	*Average by localities*	*19.9*	*18.2*
Average by localities	*19.5*	*17.7*	*Average by 17 localities*	*19.7*	*17.9*

nearly the same; the highest average age at marriage for the family male heads of any one locality is 21.7 years in Chinhai Hsien, Chekiang, and the average age at marriage of their wives is 20 years, also the highest for wives among all the localities studied. The youngest ages of marriage for both husbands and wives occurred at Laian Hsien (1921), Anhwei, and are 18.1 and 16.1 years respectively. From these marriage ages one may conclude that the length of a generation is approximately one-fifth of a century.

The social and economic effect of the "large family" life upon the thinking of the Chinese is worthy of careful original study. No qualitative data have been collected here, so no appraisal is made.

SIZE OF THE FARM FAMILY

Persons per family

The farm family consists of 5.65, 5.67 or 5.46 persons, depending upon whether one uses the average expressed by

the mean, the median, or the modal size (table 5). The range in mean size is from 4.44 in Pingsiang Hsien, Chihli, to 7.83 persons in Kaifeng Hsien, Honan. These sizes are not as large as one might suspect from the fact that approximately two-thirds of the families are of the "large family" type.[1] They

TABLE 5. THE SIZE OF THE FARM FAMILY

2640 farm families, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	THE NUMBER OF PERSONS IN THE FARM FAMILY		
	Mean	Median	Mode
North China			
Anhwei			
Hwaiyuan	5.20	5.32	5.50
Su	6.74	6.26	6.58
Chihli			
Pingsiang	4.44	4.52	4.58
Yenshan (1922)	5.35	5.52	5.47
Yenshan (1923)	5.17	5.54	5.60
Honan			
Sincheng	6.97	6.60	6.53
Kaifeng	7.83	8.07	8.63
Shansi			
Wusiang	4.51	4.73	4.47
*Average**	*5.78*	*5.72*	*5.48*
East Central China			
Anhwei			
Laian (1921)	5.53	5.41	5.64
Laian (1922)	5.72	5.73	5.47
Wuhu	5.57	5.38	5.31
Chekiang			
Chinhai	5.19	5.79	5.61
Fukien			
Lienkiang	5.02	5.33	5.47
Kiangsu			
Kiangning (S)	5.77	5.83	5.51
Kiangning (T)	6.57	6.69	6.56
Wuchin	4.87	5.15	5.32
*Average**	*5.53*	*5.63*	*5.44*
Average 16 localities	*5.65*	*5.67*	*5.46*

*The average of means is computed by localities, while the median and the mode is calculated from the frequency distributions in table 6.

[1] Actually the size is a little larger because of failure to include some children under two and possibly three years of age.

TABLE 6. FREQUENCY DISTRIBUTION OF SIZE OF FAMILY

2640 farm families, 16 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Number of families having the specified number of persons																											Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
North China																														
Anhwei																														
Hwaiyuan	1	15	21	17	25	17	9	7	3	2	1	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	124
Su	4	8	31	47	43	38	23	24	16	16	6	9	3	6	3	2	2	1	...	...	1	...	...	1	...	...	1	1	...	286
Chihli																														
Pingsiang	14	18	31	25	24	18	5	7	2	1	3	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	152
Yenshan (1922)	7	14	14	25	29	22	15	8	7	3	1	1	2	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	150
Yenshan (1923)	11	12	16	14	25	21	10	11	6	2	2	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	133
Honan																														
Sincheng	...	3	11	18	28	20	13	14	5	16	4	5	1	1	1	2	...	1	...	...	...	...	...	...	...	...	...	...	1	144
Kaifeng	...	1	3	8	13	26	22	21	19	12	13	4	5	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	149
Shansi																														
Wusiang	12	27	47	54	42	30	18	12	2	2	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	251
Total	*49*	*98*	*174*	*208*	*229*	*192*	*115*	*104*	*60*	*54*	*33*	*24*	*15*	*11*	*5*	*7*	*2*	*3*	...	...	*1*	*1*	...	*1*	...	...	*1*	*1*	*1*	*1,389*
East Central China																														
Anhwei																														
Laian (1921)	2	2	13	24	23	9	11	7	4	1	...	1	...	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	101
Laian (1922)	...	1	7	20	30	18	9	5	4	2	1	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	100
Wuhu	1	4	13	22	29	10	7	5	2	2	1	1	3	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	102
Chekiang																														
Chinhai	...	4	5	11	17	17	10	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	67
Fukien																														
Lienkiang	1	8	28	31	38	27	10	10	3	2	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	161
Kiangsu																														
Kiangning (S)	1	2	9	39	61	41	20	13	6	3	2	3	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	203
Kiangning (T)	2	7	7	29	38	37	31	26	14	13	5	1	1	3	...	2	...	...	...	...	...	...	...	...	1	...	...	...	...	217
Wuchin	1	25	48	65	73	31	33	11	2	5	5	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	300
Total	*8*	*53*	*130*	*241*	*309*	*190*	*131*	*80*	*35*	*28*	*16*	*7*	*7*	*7*	*1*	*4*	*2*	...	...	...	*1*	...	...	...	*1*	...	...	...	...	*1,251*
Total, 16 localities	*57*	*151*	*304*	*449*	*538*	*382*	*246*	*184*	*95*	*82*	*49*	*31*	*22*	*18*	*6*	*11*	*4*	*3*	...	...	*2*	*1*	...	*1*	*1*	...	*1*	*1*	*1*	*2,640*

may be compared with 4.4 persons per farm family for 2886 farm families in the United States (1) and with 5.19 persons per farm household for all such households in Japan (2). The largest family is one of 29 persons in Sincheng Hsien, Honan, although Su Hsien, Anhwei, is a close second with another of twenty-eight persons.

The frequency distribution of size of family for the total of 2640 families gives a curve asymmetrical in form chiefly because of the prevalence of the "large family" system (table 6 and fig. 2).

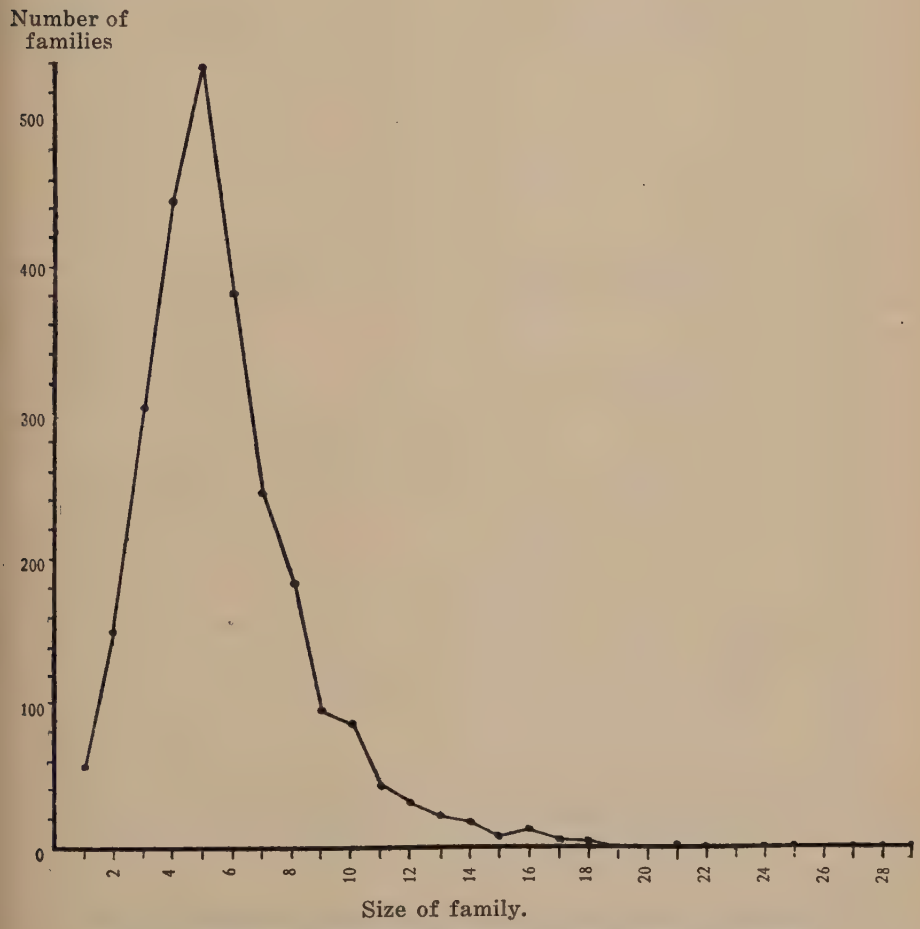

Fig. 2.—Frequency distribution of size of farm family (persons). 2640 farm families, 16 localities, seven provinces, China (1921-1925).

Frequency distribution curves for each locality (figs. 3 and 4) show that the number of families included in each study was enough to produce forms of curves quite typical, though not so smooth as the one for all the families. This is

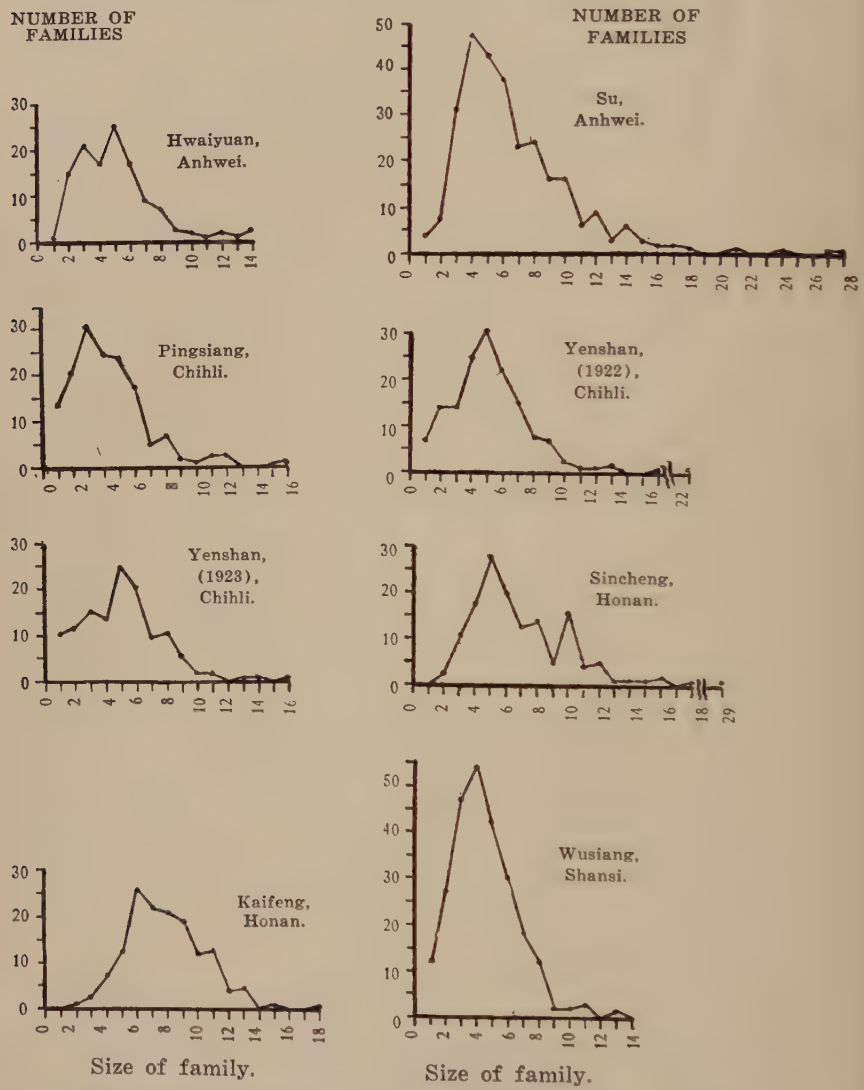

Fig. 3.—Frequency distribution of size of farm family (persons). 1389 farm families, eight localities, four provinces, North China (1921-1924).

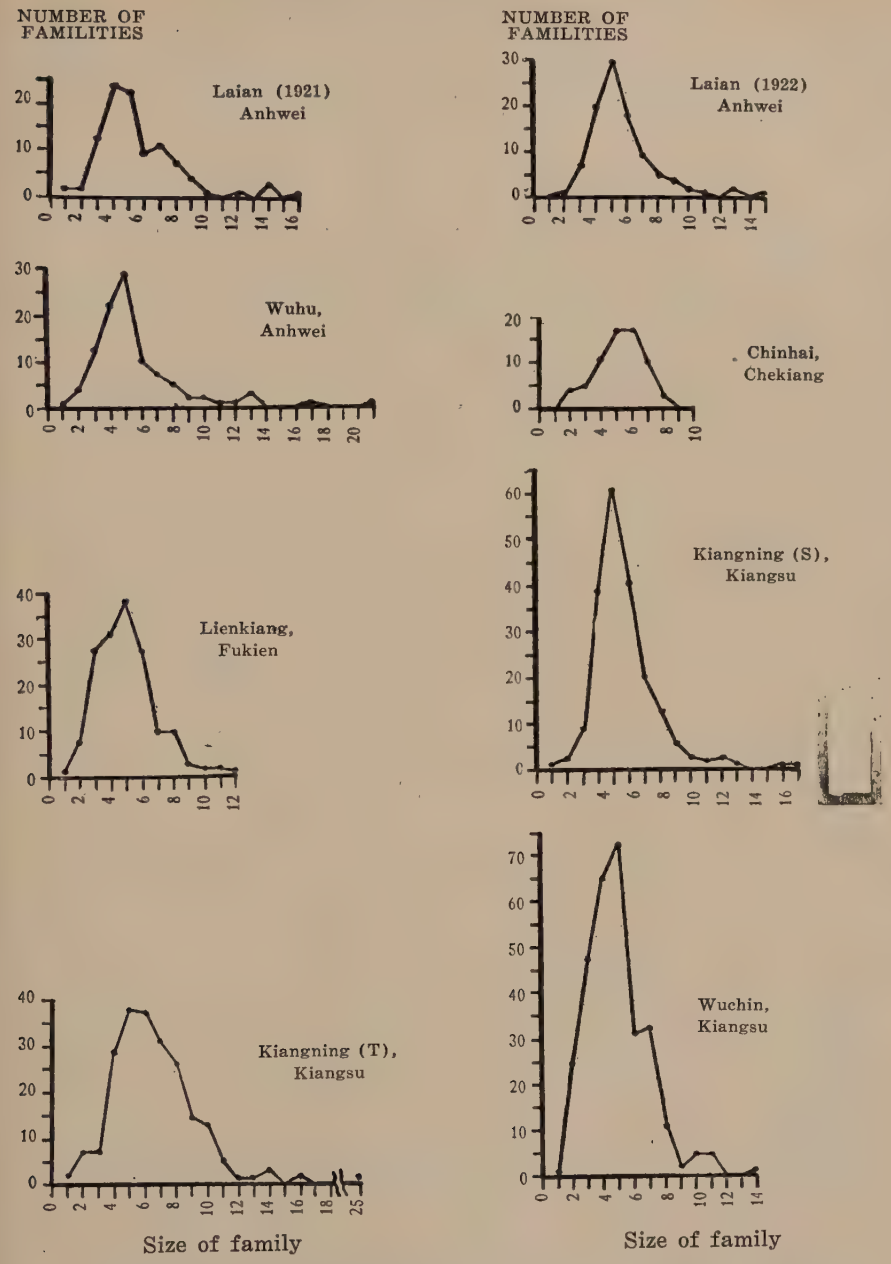

Fig. 4.—Frequency distribution of size of farm family, (persons).

1251 farm families, eight localities, four provinces, East Central China, (1921-1925).

different from some of the curves for size of farm area because of the lower variability of size of family and it shows that for a representative sample fewer cases are needed than for size of farm.

ADULT-MALE UNITS PER FAMILY

The size of the family may also be measured by the adult-male units per family. These give an arithmetic average of 4.3 (table 7). The variability of the size of the family according to the number of adult-male units is shown by the coefficient of variability which averages 44.03 for the 16

TABLE 7. RELATION OF SIZE OF FARM TO SIZE OF FAMILY (ADULT-MALE UNITS PER FARM)

2640 farms, 16 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Size of family (adult-male units per farm) for farms grouped by size of farm						Ratios of size of family (adult-male units) for different size-groups using the small size-group as the base				
	Small	Medium small	Medium	Medium large	Large	Average	Small	Medium small	Medium	Medium large	Large
North China											
Anhwei											
Hwaiyuan	2.6	3.5	4.2	4.3	6.5	4.0	100	135	162	165	250
Su	3.4	...	5.2	...	7.0	5.2	100	...	153	...	206
Chihli											
Pingsiang	2.5	...	3.1	...	4.4	3.4	100	...	124	...	176
Yenshan (1922)	2.3	3.5	...	4.3	6.2	4.1	100	152	...	187	270
Yenshan (1923)	2.3	...	4.0	...	5.5	3.9	100	...	174	...	239
Honan											
Sincheng	4.0	4.9	...	6.7	7.3	5.4	100	123	...	168	183
Kaifeng	4.3	5.0	...	6.2	7.3	5.7	100	116	...	144	170
Shansi											
Wusiang	2.7	2.7	3.9	4.0	4.3	3.4	100	100	144	148	159
Average by localities	*3.0*	...	*4.3**	...	*6.1*	*4.4*	*100*	...	*143*	...	*203*
East Central China											
Anhwei											
Laian (1921)	3.1	4.2	...	4.5	5.4	4.4	100	135	...	145	174
Laian (1922)	3.4	...	4.3	...	5.8	4.5	100	...	126	...	171
Wuhu	2.8	3.7	...	4.2	6.9	4.3	100	132	...	150	246
Chekiang											
Chinhai	3.0	...	4.0	...	4.4	3.8	100	...	133	...	147
Fukien											
Lienkiang	3.0	...	4.0	...	5.0	3.9	100	...	133	...	167
Kiangsu											
Kiangning (S)	3.5	3.6	...	4.8	5.4	4.3	100	103	...	123	154
Kiangning (T)	3.1	3.8	4.4	5.4	7.1	4.8	100	123	142	174	229
Wuchin	2.8	3.6	4.3	4.6	5.2	3.7	100	129	154	164	186
Average by localities	*3.1*	...	*4.1**	...	*5.7*	*4.2*	*100*	...	*132*	...	*184*
Average by 16 localities	*3.0*	...	*4.2**	...	*5.9*	*4.3*	*100*	...	*140*	...	*197*

*In obtaining this average, those places having farms in the medium small, medium, and medium large groups are all classified under medium.

localities and which is a little greater in North China than in East Central China. The lowest variability is for Chinhai Hsien, Chekiang, C = 31.05 ± 1.98 and the highest is for Su Hsien, Anhwei, C = 56.73 ± 2.05, showing that the range is not great because the family system is about the same in each locality (table 8).

TABLE 8. ARITHMETIC MEANS, MEDIANS, STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY OF SIZE OF FAMILY (ADULT-MALE UNITS)

2866 farms, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Means	Medians	Standard deviations	Coefficients of variability
North China				
Anhwei				
Hwaiyuan	4.0±0.11	3.5±0.14	1.85±0.08	46.25±2.37
Su	5.2±0.12	4.4±0.15	2.95±0.08	56.73±2.05
Chihli				
Pingsiang	3.4±0.09	3.2±0.11	1.71±0.07	50.29±2.39
Yenshan (1922)	4.1±0.11	3.7±0.14	2.01±0.08	49.02±2.32
Yenshan (1923)	3.9±0.12	3.8±0.15	1.97±0.08	50.51±2.57
Honan				
Sincheng	5.4±0.14	4.9±0.18	2.49±0.10	46.11±2.19
Kaifeng	5.7±0.11	5.5±0.14	1.96±0.08	34.39±1.50
Shansi				
Wusiang	3.4±0.07	3.2±0.09	1.57±0.05	46.18±1.66
Average by localities	*4.4*	*3.8*	*2.06*	*47.44*
East Central China				
Anhwei				
Laian (1921)	4.4±0.12	4.1±0.15	1.83±0.09	41.59±2.29
Laian (1922)	4.5±0.11	4.1±0.14	1.58±0.08	35.11±1.87
Wuhu	4.3±0.15	3.7±0.19	2.29±0.11	53.26±3.15
Chekiang				
Chinhai	3.8±0.10	3.6±0.13	1.18±0.07	31.05±1.98
Fukien				
Lienkiang	3.9±0.09	3.6±0.11	1.69±0.06	43.33±1.91
Kiangsu				
Kiangning (S)	4.3±0.07	3.9±0.09	1.54±0.05	35.81±1.34
Kiangning (T)	4.8±0.10	4.3±0.13	2.09±0.07	43.54±1.66
Wuchin	3.7±0.06	3.5±0.08	1.53±0.04	41.35±1.32
Average by localities	*4.2*	*3.8*	*1.72*	*40.63*
Average by 16 localities	*4.3*	*3.8*	*1.89*	*44.03*

SIZE OF FARM AND SIZE OF FAMILY

Farms when grouped by size show a significant increase in size of family as the size of farm increases. The smallest group has three adult-male units as compared with 5.9 for the largest size-group of farms (table 7). This increase in size of family with the increase in size of farm is also shown by the gross correlation coefficients, which are significant for all but one of the localities. The average of the 16 coefficients for all localities is $r = + .541$; for eight localities the coefficient is between + .50 and + .70, while for three localities it is between + .70 and + .75; the highest occurs in Kiangning Hsien (T), Kiangsu, $r = + .740 \pm 0.024$ (appendix II, table 1 and 2). The typical relationship is shown by a straight line (fig. 5).

It is not always easy to distinguish in this size of farm and size of family relationship which is the independent and which the dependent variable, since on the one hand size of farm must determine the number of persons that may be supported, while on the other, the number of people in the family determines to a large extent the amount of available farm labor. The average of the gross correlation coefficients of the variables, size of family and number of man equivalent, is $r = + .600$; while the highest is for Kiangning Hsien (T), Kiangsu,

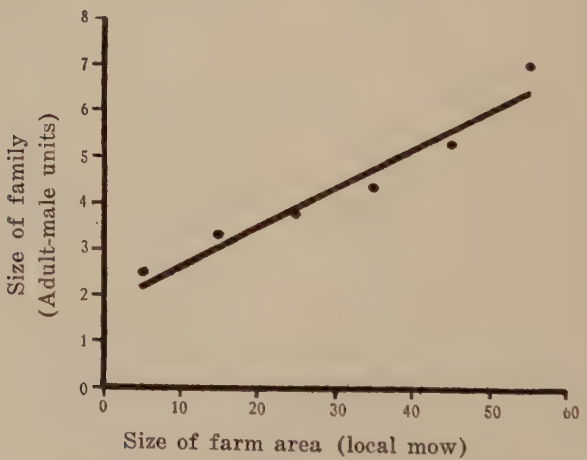

Fig. 5.—Relation of size of farm to size of family. A typical case. 217 farms, Kiangning Hsien (T), Kiangsu (1924).
For each increase of ten local mow (farm area) there is an increase of 0.86 adult-male units.

($r = .871 + 0.11$). Only one locality, Chinhai Hsien, Chekiang, had a correlation coefficient below + .30. (Appendix II, table 7).

This adjustment of size of family to size of farm is peculiar to a densely populated country like China, where the "large family" permits of considerable elasticity in size in relation to such resources as acreage of land per farm family. This elasticity is achieved in various ways; by migration of family members to other occupations; by migration to less densely populated areas, such, for instance, as Manchuria or Formosa; and by the immature deaths from inadequate nourishment which in famine areas reduce the number of persons by starvation or by sale or gift of children. Probably the increasing population in relation to a comparatively stationary tillable area is chiefly responsible for the breaking up of the "large family" system in rural China, thus bringing about an adjustment between size of farm and size of family.

AGE AND SEX DISTRIBUTION OF FARM POPULATION

Age distribution[1]

The distribution of the farm population by age and sex has been studied by single (table 9), five-year (table 10), and ten-year periods (table 9); by comparison of the standard age distribution for Sweden by years 0-1, 1-19, 20-39, 40-59, and 60 and over (table 11); and by comparison with Japan, Germany, and France (fig. 6).

A careful perusal of the distribution of population by single year ages reveals considerable variation from year to year. The five-year age groups show a more nearly normal distribution while ten-year groups appear to be almost entirely normal.

Reasons for variations may be years of crop failures resulting in insufficient nourishment and thus directly or indirectly causing deaths; the selling or giving away of children in famine years; epidemics or plagues in certain years and not in others; and inoculation for small-pox at certain ages causing more than the normal number of deaths.

The small percentage of population in the 0-4 age group is probably caused chiefly by the failure to report babies and

[1] Ages have been adjusted from the Chinese method of calculating, as explained under definitions.

TABLE 9. NUMBER AND SEX OF POPULATION BY SINGLE-YEAR AGES AND BY TEN-YEAR AGE GROUPS AND PERCENTAGE BY TEN-YEAR AGE GROUPS*

2640 farm families, 16 localities, seven provinces, China (1921-1925)

AGE	0		10		20		30		40		50		60		70		80		80	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	131	130	100	66	93	108	67	83	52	64	57	42	17	33	8	11	1	1	...	...
1	195	182	260	185	108	113	164	144	116	119	119	88	39	39	11	20	...	4	...	...
2	191	189	123	118	92	98	62	59	84	61	60	48	17	18	1	8	2	...	...	...
3	208	211	193	163	160	175	130	106	84	49	80	74	28	29	9	8	1	3	...	...
4	195	156	170	176	122	119	113	131	126	112	59	50	31	33	8	14	...	...	...	...
5	200	136	168	123	120	147	99	103	79	73	59	71	7	12	3	7	...	1	...	...
6	177	139	120	118	100	121	90	70	53	55	28	39	16	24	...	1	1	3	...	1
7	297	216	185	141	188	156	155	149	112	100	66	96	13	36	6	9	2	2	...	...
8	128	85	118	119	71	82	68	90	41	62	34	41	13	16	1	3	...	...	...	...
9	295	191	204	178	164	208	139	152	100	138	52	77	21	29	4	7	...	1	...	...
Total ..	*2017*	*1635*	*1641*	*1387*	*1218*	*1327*	*1087*	*1087*	*847*	*833*	*614*	*626*	*202*	*269*	*51*	*88*	*7*	*15*	...	*1*
Combined total of males and females	*3652*		*3028*		*2545*		*2174*		*1680*		*1240*		*471*		*139*		*22*		*1*	
Per cent of total population	*24.5*		*20.3*		*17.0*		*14.5*		*11.2*		*8.3*		*4.2 (60 years and over)*							

*Total males=7684. Total females=7268. Total population=14,952.

The population for Wutai Hsien, Shansi, was reported as 1179 persons, or 5.22 persons per family, excluding 121 hired laborers, but some omissions were made and for this reason population data for Wutai have been omitted. Other persons not included in this table are 559 absent members of the economic family, 663 laborers, and 22 servants.

TABLE 10. AGE AND SEX DISTRIBUTION OF FARM POPULATION ON BY FIVE-YEAR AGE GROUPS*
2640 farm families, 16 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Number of each sex according to age group																			
	0-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		40-44		45-49	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
North China																				
Anhwei																				
Hwaiyuan	50	31	43	26	52	23	43	34	26	19	25	30	20	19	22	28	14	12	9	20
Su	129	122	127	79	88	67	115	99	103	87	102	97	62	66	71	63	63	44	40	48
Chihli																				
Pingsiang	31	31	50	49	40	36	39	19	14	8	17	12	26	24	32	42	27	23	21	18
Yenshan (1922)	40	39	56	53	47	50	34	44	24	26	20	41	40	23	32	38	25	21	17	15
Yenshan (1923)	53	44	27	32	39	39	33	39	21	40	23	28	26	18	13	19	20	32	10	13
Honan																				
Sincheng	54	47	80	48	63	40	54	55	39	33	51	42	29	30	45	40	17	20	33	45
Kaifeng	101	112	66	34	64	86	52	42	55	51	51	59	42	39	25	19	21	24	23	25
Shansi																				
Wusiang	73	49	88	62	51	61	50	77	23	26	29	46	43	43	42	56	60	46	29	22
Total	*531*	*475*	*537*	*383*	*444*	*402*	*420*	*409*	*305*	*290*	*318*	*355*	*288*	*262*	*282*	*305*	*247*	*222*	*182*	*206*
East Central China																				
Anhwei																				
Laian (1921)	62	14	34	8	5	10	44	26	37	41	44	44	26	19	25	22	20	8	10	19
Laian (1922)	26	22	45	35	21	8	35	23	21	24	38	35	11	15	38	29	17	15	18	26
Wuhu	43	42	45	19	27	9	34	19	34	27	25	33	35	31	24	20	10	13	12	13
Chekiang																				
Chinhai	25	27	34	19	34	10	19	10	9	16	9	10	15	13	11	11	15	7	6	8
Fukien																				
Lienkiang	38	20	81	34	48	15	76	34	43	38	55	62	33	25	33	31	20	14	15	25
Kiangsu																				
Kiangning (S)	78	110	72	42	87	27	29	42	29	80	41	67	43	60	23	24	46	47	28	44
Kiangning (T)	41	93	142	146	90	139	62	62	39	37	41	42	36	43	52	50	41	48	63	35
Wuchin	76	65	107	81	90	88	76	54	58	60	72	66	49	55	63	72	46	31	51	52
Total	*389*	*393*	*560*	*384*	*402*	*306*	*375*	*270*	*270*	*323*	*325*	*359*	*248*	*261*	*269*	*259*	*215*	*183*	*203*	*222*
Total, 16 localities	*920*	*868*	*1097*	*767*	*846*	*708*	*795*	*679*	*575*	*613*	*643*	*714*	*536*	*523*	*551*	*564*	*462*	*405*	*385*	*428*
Combined total of males and females	*1788*		*1864*		*1554*		*1474*		*1188*		*1357*		*1059*		*1115*		*867*		*813*	

TABLE 10.—(*Continued*)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NUMBER OF EACH SEX ACCORDING TO AGE GROUP																			
	50-54		55-59		60-64		65-69		70-74		75-79		80-84		85-89		90 and over		Total	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
North China																				
Anhwei																				
Hwaiyuan	19	17	18	16	8	7	4	3	1	2	2	1	0	1	...	...	...	...	356	289
Su	51	45	43	42	21	15	5	6	10	11	2	2	0	1	0	1	...	...	1032	895
Chihli																				
Pingsiang	20	15	16	24	7	11	9	6	1	5	0	2	...	...	...	...	...	...	350	325
Yenshan (1922)	16	12	14	16	8	11	11	12	3	5	2	2	1	4	0	1	...	...	390	413
Yenshan (1923)	17	15	13	14	12	9	5	11	5	8	2	2	1	0	1	2	0	1	321	366
Honan																				
Sincheng	24	14	12	22	12	14	12	12	6	4	1	3	1	1	0	1	...	...	533	471
Kaifeng	33	32	21	25	16	22	6	12	2	3	2	1	...	...	...	...	...	...	580	586
Shansi																				
Wusiang	26	22	22	21	13	13	7	11	6	5	0	6	...	...	2	2	...	...	564	568
Total	*206*	*172*	*159*	*180*	*97*	*102*	*59*	*73*	*34*	*43*	*11*	*19*	*3*	*7*	*3*	*7*	...	*1*	*4126*	*3913*
East Central China																				
Anhwei																				
Laian (1921)	13	1	4	7	2	11	0	1	0	1	...	...	1	0	...	...	...	...	327	232
Laian (1922)	24	14	7	14	1	2	2	5	1	0	...	...	...	...	...	...	...	...	305	267
Wuhu	15	10	11	6	8	0	0	3	...	...	...	...	...	...	...	...	...	...	323	245
Chekiang																				
Chinhai	6	6	5	6	4	3	1	4	2	2	0	1	...	...	...	...	...	...	195	153
Fukien																				
Lienkiang	14	11	6	16	1	3	4	5	0	6	0	2	...	...	...	...	...	...	467	341
Kiangsu																				
Kiangning (S)	29	30	17	39	9	16	1	7	0	1	2	1	...	...	...	...	...	...	534	637
Kiangning (T)	35	26	15	23	6	9	0	6	0	1	1	1	...	...	...	...	...	...	664	761
Wuchin	33	32	15	33	4	6	3	13	0	7	0	3	0	1	...	...	...	...	743	719
Total	*169*	*130*	*80*	*144*	*35*	*50*	*11*	*44*	*3*	*18*	*3*	*8*	*1*	*1*	...	...	...	...	*3558*	*3355*
Total, 16 localities	*375*	*302*	*239*	*324*	*132*	*152*	*70*	*117*	*37*	*61*	*14*	*27*	*4*	*8*	*3*	*7*	...	*1*	*7684*	*7268*
Combined total of males and females	*677*		*563*		*284*		*187*		*98*		*41*		*12*		*10*		*1*		*14952*	

*The abbreviation M and F are used for male and female.

TABLE 11. A COMPARISON OF CHINA'S FARM POPULATION WITH THE STANDARD AGE DISTRIBUTION OF SWEDEN

2640 farm families, 16 localities, seven provinces, China (1921-25)

Provinces and hsiens in which studies were made	Per cent of population by age groups					
	0-1	1-19	20-39	40-59	60-	Total
North China						
Anhwei						
Hwaiyuan	1.24	45.58	29.30	19.38	4.50	100.00
Su	3.43	39.44	33.78	19.51	3.84	100.00
Chihli						
Pingsiang	3.56	40.15	25.92	24.30	6.07	100.00
Yenshan (1922)	1.12	44.08	30.39	16.94	7.47	100.00
Yenshan (1923)	2.18	42.36	27.36	19.51	8.59	100.00
Honan						
Sincheng	1.39	42.53	30.78	18.63	6.67	100.00
Kaifeng	3.17	44.60	29.24	17.50	5.49	100.00
Shansi						
Wusiang	1.32	43.82	27.21	21.91	5.74	100.00
Weighted average	*2.34*	*42.49*	*29.89*	*19.56*	*5.72*	*100.00*
East Central China						
Anhwei						
Laian (1921)	2.33	33.99	46.15	14.67	2.86	100.00
Laian (1922)	1.92	35.66	36.90	23.60	1.92	100.00
Wuhu	0.18	41.72	40.32	15.84	1.94	100.00
Chekiang						
Chinhai	2.01	49.14	27.01	16.95	4.89	100.00
Fukien						
Lienkiang	0.49	42.33	39.60	14.98	2.60	100.00
Kiangsu						
Kiangning (S)	1.45	40.14	31.34	23.91	3.16	100.00
Kiangning (T)	0.84	53.54	23.86	20.07	1.69	100.00
Wuchin	0.55	43.02	33.86	20.04	2.53	100.00
Weighted average	*1.06*	*43.48*	*33.47*	*19.47*	*2.52*	*100.00*
Weighted average, 16 localities	*1.75*	*42.95*	*31.55*	*19.52*	*4.23*	*100.00*
Sweden	2.55	39.80	26.96	19.23	11.46	100.00

young children, a very common omission. A lower birth rate in recent years, or an unusual number of deaths of babies and children, could also account for the condition but both are probably of less importance than the omission in count.

It may be noted in passing that the number of people, male and female, is quite consistently greater in odd than in

even years. On the basis of Chinese age this means in even years. There may be a tendency for farmers in reporting ages to give them in even rather than in odd numbers.

Comparison with other population types.—Comparing the age distribution of these farm population groups in China with those of Sweden (table 11), it is seen that 2.55 per cent of Sweden's population is under the age of one while in China the percentage is 1.75, notably lower, and caused probably by failure to record babies. For the age group of 1-19 Sweden's population is 39.80 per cent compared with 42.95 for China. For the 20-39 age group Sweden's population is 26.96 per cent compared with 31.55 for China. In the 40-59 age group the proportion is about the same for Sweden and China. However, for the age group of 60 and over Sweden has nearly three times the number that China has, apparently because of greater longevity.

The age distribution for other countries, such as Japan, Germany, and France, shows practically the same relationship as for Sweden, i.e., a smaller proportion of population, with the exception of Japan, in the first two decades; a larger proportion for the second, third, fourth and fifth decades, with the exception of France; and a much smaller proportion for the years 60 and over (fig. 6).

Another method of comparison is to use Sundbarg's standard (3), which takes Sweden's population as a norm for a stationary population and gives a standard for progressive and regressive types of population (table 12). This comparison is accomplished by finding the proportion of population between the ages of 0-14, 15-49, and 50 and over. Judged by this standard, the population of the farm groups studied is between the progressive and the stationary type, which means that the population is increasing. Probably the population studied belongs wholly in the progressive type when one considers the shorter longevity in comparison with other countries and the fact that for the early age groups some omissions have been made in the count.

Sex Distribution

The proportion of males to females shows four distinct variations (fig. 7, table 13). The first period has a predominance of males, the second has more females than males, the

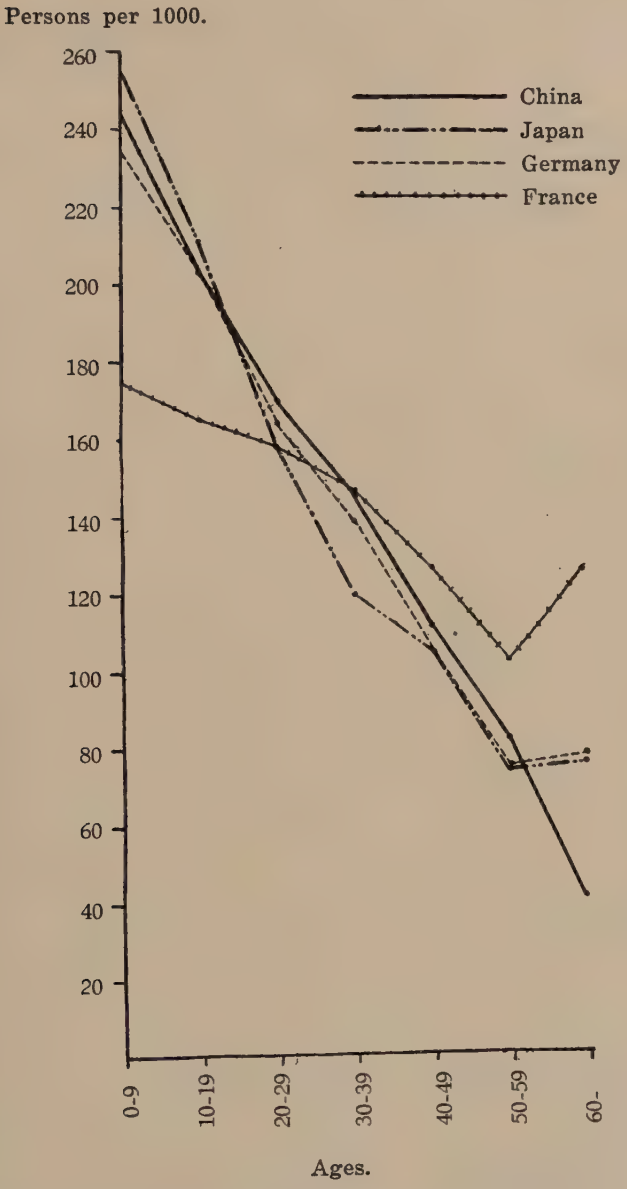

Fig. 6.—The number of persons per 1000 of all ages for China,* Japan†, Germany†, and France†.

*2640 farm families, 16 localities, seven provinces, China, (1921-1925).

†International Statistical Yearbook, 1926. League of Nations Japan, 1925; Germany, 1910; France, 1911.

TABLE 12. THE TYPE OF FARM POPULATION IN CHINA COMPARED WITH SWEDEN AND UNITED STATES AND WITH PROGRESSIVE, STATIONARY, AND REGRESSIVE TYPES

2640 farm families, 16 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Per cent of population by age groups		
	0-14	15-49	50-
North China			
Anhwei			
Hwaiyuan	35	50	15
Su	32	55	13
Chihli			
Pingsiang	35	48	17
Yenshan (1922)	35	50	15
Yenshan (1923)	34	49	17
Honan			
Sincheng	33	53	14
Kaifeng	40	45	15
Shansi			
Wusiang	34	52	14
Weighted average	*35*	*50*	*15*
East Central China			
Anhwei			
Laian (1921)	24	69	7
Laian (1922)	28	60	12
Wuhu	33	58	9
Chekiang			
Chinhai	43	46	11
Fukien			
Lienkiang	29	62	9
Kiangsu			
Kiangning (S)	36	51	13
Kiangning (T)	46	46	8
Wuchin	35	55	10
Weighted average	*35*	*55*	*10*
Average 16 localities	*35*	*53*	*12*
Sweden (1751-1900)*	33	50	17
U.S.A. (1910)*	32	54	15
Sundbarg's standard*:			
Progressive type	40	50	10
Stationary type	33	50	17
Regressive type	20	50	30

*See Whipple, G. C., Vital Statistics. The data for U.S.A., as published by Whipple, equal 101 rather than 100.

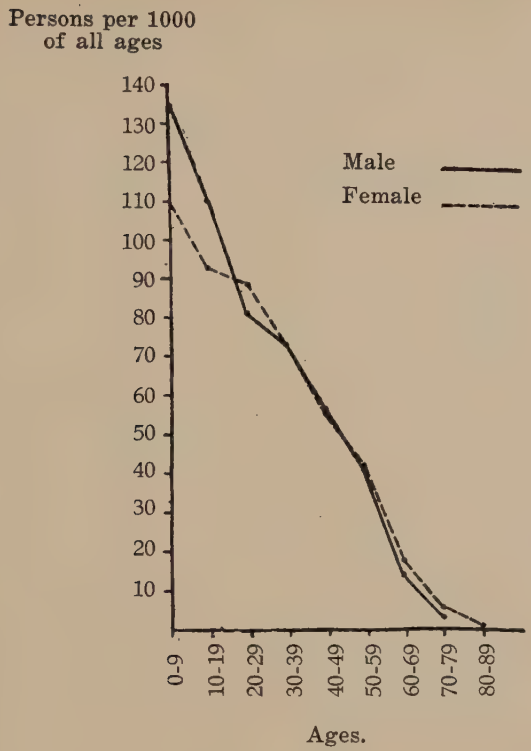

Fig. 7.—The number of males and females per 1000 persons of all ages by ten-year age groups.

2640 farm families, 16 localities, seven provinces, China (1921-1925).

third is about equal, and the fourth has more females than males. The average ratio of males to females is 105.7, a lower ratio than in a number of other population groups.

Another study of entirely different farm population groups shows even a greater ratio of males to females which is 114 (4). Ten-year age groups show fewer females than males for all of the first five decades after which the number of females is greater than the number of males. This same tendency for males to exceed females is also shown in the studies made by the China International Famine Relief Commission for farm families in North and East Central China (5).

In this study for the first two decades the ratio of males to females is 123.4 for the 0-9 age group, and 118.3 for the 10-19 group. The ratio by five-year groups shows much variation and

TABLE 13. RATIO OF MALES TO 100 FEMALES BY FIVE-YEAR AGE GROUPS

2640 farm families, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	Total
North China																			
Anhwei																			
Hwaiyuan ..	161.3	165.4	226.1	126.5	136.8	83.3	105.3	78.6	116.7	45.0	111.8	112.5	114.3	133.3	50.0	200.0	...	...	124.6
Su	105.7	160.8	131.3	116.2	118.4	105.2	93.9	112.7	143.2	83.3	113.3	102.4	140.0	83.3	90.9	100.0	...	...	115.3
Chihli																			
Pingsiang ..	100.0	102.0	111.1	205.3	175.0	141.7	108.3	76.2	117.4	116.7	133.3	66.7	63.6	150.0	20.0	...	...	...	107.7
Yenshan (1922)	102.6	105.7	94.0	77.3	92.3	48.8	173.9	84.2	119.0	113.3	133.3	87.5	72.7	91.7	60.0	100.0	25.0	...	94.4
Yenshan (1923)	120.5	84.4	100.0	84.6	52.5	82.1	144.4	68.4	62.5	76.9	113.3	92.9	133.3	45.4	62.5	100.0	...	50.0	87.7
Honan																			
Sincheng	114.9	166.7	157.5	98.2	118.2	121.4	96.7	112.5	85.0	73.3	171.4	54.5	85.7	100.0	150.0	33.3	100.0	...	113.2
Kaifeng	90.2	194.1	74.4	123.8	107.8	86.4	107.7	131.6	87.5	92.0	103.1	84.0	72.7	50.0	66.7	200.0	...	...	99.0
Shansi																			
Wusiang	149.0	141.9	83.6	64.9	88.5	63.0	100.0	75.0	130.4	131.8	118.2	104.8	100.0	63.6	120.0	...	...	100.0	99.3
Weighted average	*111.3*	*140.2*	*110.4*	*102.7*	*105.2*	*89.6*	*109.9*	*92.5*	*111.3*	*88.3*	*119.3*	*88.3*	*95.1*	*80.8*	*79.1*	*57.9*	*42.9*	*42.9*	*105.4*
East Central China																			
Anhwei																			
Laian (1921) ..	442.9	425.0	50.0	169.2	90.2	100.0	136.8	113.6	250.0	52.6	1300.0	57.1	18.2	...	...	...	...	...	140.9
Laian (1922) ..	118.2	128.6	262.5	152.2	87.5	108.6	73.3	131.0	113.3	69.2	171.4	50.0	50.0	40.0	...	...	...	...	114.2
Wuhu	102.4	236.8	300.0	178.9	125.9	75.8	112.9	120.0	76.9	92.3	150.0	183.3	...	...	...	...	...	...	131.8
Chekiang																			
Chinhai	92.8	178.9	340.0	190.0	56.3	90.0	115.4	100.0	214.3	75.0	100.0	83.3	133.3	25.0	100.0	...	...	...	127.5
Fukien																			
Lienkiang ..	190.0	238.2	320.0	223.5	113.1	88.7	132.0	106.5	142.9	60.0	127.3	37.5	33.3	80.0	...	...	...	...	137.0
Kiangsu																			
Kiangning (S)	70.9	174.1	322.2	69.0	36.3	61.2	71.7	95.8	97.8	63.6	96.7	43.6	56.3	14.3	...	200.0	...	...	83.8
Kiangning (T)	44.1	97.3	64.7	100.0	105.4	97.6	83.7	104.0	85.4	180.0	134.6	65.2	66.7	...	...	100.0	...	...	87.3
Wuchin	116.9	132.1	102.3	140.7	96.7	109.1	89.1	87.5	148.4	98.1	103.1	45.5	66.7	23.1	...	...	...	...	103.3
Weighted average	*99.0*	*145.8*	*131.4*	*138.9*	*83.6*	*90.5*	*95.0*	*103.9*	*117.5*	*91.4*	*130.0*	*55.6*	*70.0*	*25.0*	*16.7*	*37.5*	*100.0*	...	*106.1*
Weighted average, 16 localities ..	*106.0*	*143.0*	*119.5*	*117.1*	*93.8*	90.1	102.5	97.7	*114.1*	*90.0*	*124.2*	*73.8*	*86.8*	*59.8*	*60.7*	*51.9*	*50.0*	*42.9*	*105.7*
Ratio by ten-year age groups ..	*123.4*		*113.3*		*91.8*		*100.0*		*101.7*		*98.1*		*75.1*		*58.0*		*46.7*		

reaches 143 for the years 5-9. The reason for this high ratio in comparison with that of 106 for the age group of 0-4 and with that of 119.5 for the age group of 10-14 is not clear. The actual number of males increased 19 per cent from the 0-4 age group to the 5-9 age group while the number of females decreased 13 per cent. This increase in males over previous years is difficult to account for and might be caused by non-enumeration in the earlier group, bias in reporting ages older than actual age, deaths through some special cause, and a lower birth rate. Adoption is not a cause since the number of children adopted is very small (table 2). Insufficient quantitative data would also hardly appear to be a reason since the number of individuals in the groups is from 800 to 1100. The rapid decrease in males from the 0-9 to the 10-19 year groups is undoubtedly caused by a high death rate of males and by some emigration.

Since vital statistics for most countries show that few more males are born than females, the high proportion of males must be accounted for in the different treatment given to boys and girls. Infanticide is a well-known practice in China for limiting population increase, more common in some regions, however, than in others. Mere custom, as well as economic pressure, probably plays an important part in determining differences between regions in this practice. Perhaps opportunity of migration to unsettled lands, such as Manchuria, and to growing cities gives an outlet that helps to control the amount of infanticide. In Wuhu Hsien, Anhwei, located in the Yangtze Valley, the practice is very prevalent while in Yenshan Hsien, Chihli, where people migrate to Manchuria, no trace of it could be found. Families who feel themselves too poor to support a new born girl baby, a non-earner addition to the family, but who object to the use of the infanticide method, often place the baby in an orphanage. This is especially true in the Yangtze Valley. Frequently these babies are given by the orphanage to farm families to raise in return for a small sum per month.

Still another contributing factor to the large proportion of boys is the better care they have. Social custom demands that each family must have a male heir. It is an adage that "Of the three unfilial acts the greatest is to have no heirs (sons)" (不孝有三無後爲大). Several sons are considered especially desirable. The lower esteem in which girl babies are held is

also shown by the adage "A girl baby means some other family name" (女生外姓).

Other factors raising the ratio of males to females are the demand for girls in big cities as slave girls, concubines, prostitutes, and sing-song girls. These conditions are more prevalent, probably, in East Central China than in North China and contribute therefore to make the ratio of males higher in the former.

The second variation is during the age period of 20-29 when there are fewer males than females, the ratio being 91.8. Emigration of male members of the family to other less densely populated districts or to other occupations appears to be the chief cause of this difference. This is corroborated by the age distribution of the absent members of the "economic family" (table 14) and would undoubtedly be still more clearly shown by age distribution for other members who have broken off all financial relations with the family.

In the 25-29 age group for North China and the 20-24 and 25-29 age group for East Central China the number of females is much greater than in the previous age group. An extreme number of deaths or migration for the previous age group in a particular year or years could account for it.

For the years 30-59 the proportion by ten-year groups is about equal and is probably accounted for, chiefly, by the mortality of women giving birth to children, by suicide of women, and partially by the return of absent male members of the family. The ratio for these three decades in order are 100.0, 101.7 and 98.1.

Above sixty years the males are much less in proportion to the females because of the greater longevity of the women common also to most population groups in other countries. The ratios of male to females are 75.1, 58.0, and 46.7 for these last three decades.

AGE AND SEX DISTRIBUTION OF NON-FAMILY MEMBERS OF THE HOUSEHOLD

Farm laborers hired by the year constitute the bulk of the non-family members of the household (table 15). Of these only three were women. The ages of the male farm laborers ranged from 11 to 61 years, the most frequent age being 39 years. Of

TABLE 14. SEX DISTRIBUTION BY FIVE-YEAR PERIODS FOR ABSENT MEMBERS OF THE "ECONOMIC FAMILY"

2109 farm families, 11 localities, five provinces, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	NUMBER OF ABSENT MEMBERS BY GROUPS																																Percentage of absent members to total population
	0-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70-74		75-79		Total		Tota	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M & F	
North China																																		
Anhwei																																		
Hwaiyuan ..	...	...	...	...	2	...	3	...	7	1	8	...	8	...	3	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	33	1	34	...
Su	3	...	1	...	1	1	7	...	6	2	7	5	2	2	6	1	1	...	2	1	1	1	...	...	...	...	...	...	1	...	...	1	38	14	52	...
Chihli																																		
Pingsiang ..	...	...	...	...	...	...	5	...	8	...	7	...	5	...	8	...	3	...	2	...	1	...	1	...	1	...	1	...	...	...	...	...	42	...	42	...
Yenshan (1922)	...	...	...	...	2	...	12	...	7	1	7	2	9	...	7	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	45	4	49	...
Yenshan (1923)	1	...	1	1	9	...	15	2	10	1	14	...	8	5	9	2	3	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	71	12	83	...
Honan																																		
Sincheng.. ..	...	...	...	...	...	...	4	1	13	...	2	1	1	...	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	24	2	26	...
Kaifeng	...	...	...	...	...	...	...	...	1	...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	6	...
Shansi																																		
Wusiang	...	...	...	...	6	...	27	...	26	...	20	...	13	...	10	...	5	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	110	...	110	...
Total ..	*4*	...	*2*	*1*	*20*	*1*	*73*	*3*	*78*	*5*	*68*	*8*	*48*	*7*	*46*	*3*	*13*	...	*7*	*2*	*3*	*1*	*2*	*1*	*2*	...	*2*	...	*1*	...	...	*1*	*369*	*33*	*402*	*2.7*
East Central China																																		
Kiangsu																																		
Kiangning (S)	...	...	...	...	1	...	15	...	22	...	23	1	15	...	6	...	3	...	2	...	1	...	1	...	3	...	...	...	...	...	1	...	93	1	94	...
Kiangning (T)	...	...	1	...	...	...	4	...	1	...	3	1	2	...	...	1	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	14	2	16	...
Wuchin	...	...	...	...	3	1	14	2	13	3	5	2	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	39	8	47	...
Total ..	...	...	*1*	...	*4*	*1*	*33*	*2*	*36*	*3*	*31*	*4*	*19*	...	*8*	*1*	*4*	...	*4*	...	*1*	...	*1*	...	*3*	...	...	...	...	...	...	...	*146*	*11*	*157*	*1.0*
Total, 11 localities	*4*	...	*3*	*1*	*24*	*2*	*106*	*5*	*114*	*8*	*99*	*12*	*67*	*7*	*54*	*4*	*17*	...	*11*	*2*	*4*	*1*	*3*	*1*	*5*	...	*2*	...	*1*	...	*1*	*1*	*515*	*44*	*559*	*3.7*

TABLE 15. AGE AND SEX DISTRIBUTION OF NON-FAMILY MEMBERS OF THE HOUSEHOLD

2640 farm families, seven provinces, China (1921-1925)

Age	Hired laborers		Servants	
	Male	Female	Male	Female
7	...	...	...	1
11	3	...	...	1
12	3	...	...	...
13	9	...	...	1
14	9	...	...	...
15	6	...	...	...
16	4	...	...	1
17	4	...	...	...
18	6	...	...	...
19	15	...	1	4
20	8	...	...	...
21	11	...	...	1
22	5	...	...	...
23	23	...	...	1
24	19	...	...	1
25	11	...	...	...
26	9	...	...	...
27	34	...	...	2
28	17	...	...	...
29	37	...	...	1
30	8	...	...	...
31	32	...	...	1
32	9	...	...	...
33	21	...	...	...
34	32	...	1	...
35	22	...	...	1
36	12	...	...	...
37	25	1	...	...
38	11	...	...	...
39	51	...	...	2
40	7	...	...	...
41	18	...	1	...
42	9	...	...	...
43	3	...	...	...
44	8	...	...	...
45	7	...	...	...
46	...	...	...	...
47	2	...	...	...
48	...	...	...	...
49	12	1	...	...
50	1	...	...	...
51	2	...	...	...
52	...	...	...	...
53	...	...	...	...
54	2	...	...	...
55	1	...	...	1
56	...	...	...	...
57	1	...	...	...
58	...	...	...	...
59	5	...	...	...
60	...	...	...	...
61	1	...	...	...
Unknown	125	1	...	...
Total ..	*660*	*3*	*3*	*19*

the 22 servants, 18 were for Su Hsien, Anhwei, and only three were males.

EMIGRATION

Emigration is usually from farms in densely settled districts, such as in North China, to farms in a sparsely settled country like Manchuria. In Yenshan Hsien, Chihli, this migration is of three types. The least frequent is where the whole family leaves its native country permanently. This occurs only in case of extreme necessity. A second type is that of the individual, almost always the young man, who is obliged to seek work for his living and to assist in the support of his family. Some of these individuals return to their homes at least once a year, usually at the New Year season, while others may not return for several years. The third kind is that of the individual who leaves for short periods when there is no work to do at home. This is most common after the harvests are over, migration beginning then to Tientsin or some nearby place. The chief occupation of these

temporary migrants is making brick and roof tiles. These people return to the village in time for spring work on the farm.

The effect of a year of crop failure on emigration is apparently shown by the 12.1 per cent of absent members for the families in the locality of Yenshan studied in 1923 compared with 6.1 for the families in the locality of the Yenshan studied in 1922.

Since the surveys in this study were made there has been, in 1927 and 1928, one of the greatest emigration movements in the world of families from the country districts of Shantung to Manchuria. It is caused by crop failures, high taxation, and banditry.

AGE AND SEX OF ABSENT MEMBERS OF THE "ECONOMIC FAMILY"

Some members of the family live outside the family household but still continue to contribute to the family exchequer to the extent of nearly eleven dollars a year per household. Such persons have left the home farm through a preference for other types of work or more often because the farm itself does not supply enough work. It is the young men who are away from home and they range in age from 15 to 40 years. For North China 5.0 per cent of the total population are classified as absent members of the "economic family," while in East Central China 2.3 per cent are so classified. The average for all regions studied is 3.7 per cent of the total population (table 16). Less than one per cent of the absent members are females.

Of the total absent members 58 per cent are sons and 18 per cent are brothers of the farm operator (table 16). The remainder are scattered among numerous relatives. This is quite consistently true for most places. It is only natural that in China as in other countries sons should be leaving the farm when there is not enough work to be done there. There may be other reasons but the small size of the farm probably makes the problem of sufficient work for support the major one.

DENSITY OF POPULATION

The usual method of determining density of population is by finding the number of persons per unit square area, such as per square mile or per square kilometer, regardless of the nature

TABLE 16. PERCENTAGE DISTRIBUTION OF ABSENT MEMBERS OF THE "ECONOMIC" FAMILY BY SPECIFIED RELATIONSHIP TO THE MALE FAMILY HEAD

2054 farm families, 11 localities, five provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Percent of absent members to total members of the "economic" family	Generation of the family head						First generation preceeding that of the operator				First generation succeeding that of the operator						Second generation succeeding that of the operator			Total
		Male heads	Wife	Brother	Brothers' wives	Wife's brothers	Sisters	Father	Mother	Father's brothers	Father's brothers' wives	Sons	Daughters	Daughters-in-law (sons' wives)	Sons-in-law (daughters' husbands)	Nephews (brothers' sons)	Nieces (brothers' sons' wives)	Grand sons (sons' sons)	Grand daughters (sons' daughters)	Grand nephews (brothers' grandsons)	
North China																					
Anhwei																					
Hwaiyuan	5.3	5.8	...	29.4	...	...	...	...	...	3.0	...	50.0	...	3.0	...	8.8	...	...	...	...	100
Su	2.7	3.9	...	13.5	7.7	...	...	1.9	1.9	3.9	1.9	34.6	...	11.5	...	3.9	1.9	9.6	1.9	1.9	100
Chihli																					
Pingsiang	6.2	...	...	52.4	...	...	...	7.1	...	...	...	28.6	...	...	...	9.5	...	2.4	...	...	100
Yenshan (1922) .	6.1	...	...	28.6	4.1	...	...	2.0	2.0	...	...	49.0	...	2.0	...	...	...	12.3	...	...	100
Yenshan (1923) .	12.1	10.9	4.8	15.7	1.2	...	...	1.2	...	...	...	50.6	1.2	6.0	...	1.2	...	6.0	1.2	...	100
Honan																					
Sincheng	2.6	...	...	19.2	...	...	...	...	...	...	...	69.2	...	7.7	...	3.9	...	...	...	...	100
Kaifeng	0.5	...	...	16.7	...	...	...	...	...	...	...	83.3	...	...	...	...	...	...	...	...	100
Shansi																					
Wusiang	9.7	3.6	...	10.9	...	...	...	...	...	...	...	76.4	...	...	...	5.5	...	3.6	...	...	100
Weighted average .	*5.0*	*4.2*	*1.0*	*20.9*	*1.8*	...	...	*1.5*	*0.5*	*0.8*	*0.2*	*54.8*	*0.2*	*3.8*	...	*4.2*	*0.2*	*5.2*	*0.5*	*0.2*	*100*
East Central China																					
Kiangsu																					
Kiangning (S) ..	8.0	13.8	...	5.3	...	...	...	1.1	...	...	...	74.5	...	1.1	...	...	...	4.2	...	...	100
Kiangning (T) ..	1.1	6.3	...	18.6	6.3	6.3	...	...	...	...	...	31.1	...	6.3	6.3	12.5	...	6.3	...	...	100
Wuchin	3.2	...	...	23.4	...	...	2.1	...	...	...	...	59.6	4.3	10.6	...	...	...	...	...	...	100
Weighted average .	*2.3*	*8.9*	...	*12.1*	*0.6*	*0.6*	*0.6*	*0.6*	...	...	...	*65.6*	*1.3*	*4.5*	*0.6*	*1.3*	...	*3.2*	...	...	*100*
Weighted average by 11 localities .. .	*3.7*	*5.5*	*0.7*	*18.4*	*1.4*	*0.3*	*0.2*	*1.3*	*0.4*	*0.5*	*0.2*	*57.8*	*0.5*	*3.9*	*0.2*	*3.4*	*0.2*	*4.6*	*0.4*	*0.2*	*100*

of the productivity of the land. In comparing density of farm population between countries, density per unit of cultivated area is a much better measure. On 2640 farms the density per kilometer is 282, or 730 per square mile (table 17). It is lower, 240 per square kilometer, in North China, where the growing season is shorter and the rainfall less than and not so well

TABLE 17. DENSITY OF POPULATION

2640 farms, 16 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Crop area in mow* per person	Number of persons per square kilometer (crop area)	Number of persons per square mile (crop area)	Crop area per adult-male unit (hectares)	Crop hectares per adult-male unit
North China					
Anhwei					
Hwaiyuan	10.8	151	390	.88	1.41
Su	10.8	151	390	.88	1.40
Chihli					
Pingsiang	3.6	452	1171	.29	.36
Yenshan (1922)	5.6	291	753	.45	.69
Yenshan (1923)	10.7	152	394	.87	1.26
Honan					
Sincheng	7.0	233	602	.56	.95
Kaifeng	6.7	243	629	.56	.95
Shansi					
Wusiang	6.6	247	639	.53	.56
Average by localities	*7.7†*	*240*	*621*	*.63*	*.95*
East Central China					
Anhwei					
Laian (1921)	11.7	139	360	.90	1.08
Laian (1922)	7.2	226	585	.56	.74
Wuhu	4.9	332	860	.39	.69
Chekiang					
Chinhai	4.1	397	1028	.34	.38
Fukien					
Lienkiang	3.3	493	1277	.26	.29
Kiangsu					
Kiangning (S)	5.9	276	714	.49	.98
Kiangning (T)	5.4	301	781	.45	.71
Wuchin	3.8	428	1109	.31	.55
Average by localities	*5.8‡*	*324*	*839*	*.46*	*.68*
Average by 16 localities	*6.8§*	*282*	*730*	*.55*	*.81*

*Peking Government Standard.
†Equivalent to 0.47 hectares, or 1.2 acres.
‡Equivalent to 0.34 hectares, or 0.8 acres.
§Equivalent to 0.41 hectares, or 1.0 acres.

distributed as in East Central China, where the density is 324 per square kilometer. The range is from 139 to 493 per square kilometer, or 360 to 1277 per square mile of farm area, and is caused chiefly by variation in productivity of the land, although actual differences may occur with equivalent resources. These densities may be compared with Denmark, having 30 persons per square kilometer or 77 per square mile of cultivated area, with Japan (6) having 478 per square kilometer, or 1238 per square mile, and with U.S.A. (6) having 19 persons per square kilometer or 48 per square mile of cultivated area (crop land). Compared with Japan, the density of China's farm population in the localities studied is less, chiefly because of lower production per unit area. Denmark and the United States have much more sparse population because of the use of more animal products, which require relatively more land, and because in the case of Denmark, where land is not as plentiful as it has been in the United States, of unwillingness to accept the lower standard of living that might result from crowding more people on the land.

Another method of measuring density is by number of persons or adult-male units per unit of land measure on farms. The average crop area per person is slightly over one acre while the crop area per adult-male unit for all localities is 0.55 hectares, or 1.4 acres (table 17). The range shows a percentage difference of 25.5 per cent caused by variations in quality of land, fertility added and in the case of Laian Hsien (1921) by a high proportion of larger farms in the sample.

The crop area per adult-male unit is considerably larger in North China, 0.63 hectares, than in East Central China where it is 0.46 hectares and may be accounted for by the longer growing season in the latter, making possible greater production from the same amount of land. Eliminating the factor of double cropping a comparison of crop hectares per adult-male unit still shows a larger area for North China, 0.95 hectares as compared with 0.68 hectares for East Central China.

One cannot talk with many people in China who are in practical contact with farmers without being impressed with the constant reference to the increasing population in relation to land supply and to what is considered the resulting high prices of food products. Rising prices, of course, may be caused by a number of factors, but even so, the people feel that one

great reason is the pressure of population upon land supply. That farm population is increasing is also shown by a study of 4216 farm families in eleven localities of four provinces, where population is doubling in 70 years if the rate of the natural increase for the year to which the data apply is projected over a longer period (4). The significance of this density of population is further explained in the concluding paragraphs of the chapter on standard of living.

The population problem in China has received attention in past centuries and that its essential relation to economic and social life has been appreciated is evidenced by the following translations from sayings of the ancients, and with these this chapter is closed.

Mencius says:—An increasing population over a long period of time brings about strife and disorder (7).

Han Fei-tzu in the Fourth Century B.C. says:—In the ancient times people were few but wealthy and without strife; the government gave no rewards or punishment because people were self-controlled. People at present think five sons are not too much, and each son has five sons also; and when the grandfather is not dead there are twenty-five descendants. Therefore, people are more and wealth is less; they work hard and receive little. Even if the government uses twice as much reward and twice as much punishment strife cannot be prevented (8).

In a famine during the spring an older brother does not share a portion of his food with a younger brother, but if there is a good harvest in the autumn, even strangers are given food to eat. This is not because of lack of love for one's brother but because of more or less wealth. Therefore, in ancient times, generosity meant nothing because of greater wealth. Strife at the present time is because wealth is less (shortage of food), (9).

The attitude of parents to offspring is if a boy is born there are many congratulations, but if a girl is born it is killed. The boys and girls are borne by the same mother, but the boy receives congratulations from others and the girl is killed! Why? Because to keep a girl is inconvenient and uneconomical (10).

During ancient times the people were few and there was good relationship and plenty of wealth and people were easily satisfied. At that time one man would give the throne to another. If population is small good relationship is bound to exist (11).

The wealth of a nation depends upon people having enough food, not upon the number of people (12).

An ancient poem reads:—Wild fire (*i.e.*, fighting), cannot burn (*i.e.*, kill) all things; the spring wind blows and again produces (people), (13).

Li Shen of the Tang Dynasty says:—During the spring one seed is sown, but during the autumn a million seeds are harvested. Within the four seas there is no uncultivated land, but the people still starve to death (14).

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CHAPTER X

FOOD CONSUMPTION

In China much of the food consumed by the farm family is produced on the farmer's own farm and the question of a food dietary, therefore, depends a great deal for its answer on the type of crops grown. Because of this relation, a study of diet properly belongs in any analysis of farm organization, since if there is a change involving the raising of different crops or a larger or smaller area of those already grown, this change affects directly the kinds of food to which the family is accustomed.

The dietary data here used were collected by the same method as those for the farm business and covered a previous period of one year. The use of data for a full year period is very important because of the seasonal nature of the farmer's diet.

There were two sources for finding out the amount of food consumed by the farm family; first, the farm schedules separated the quantity of food eaten by the family from quantities sold or otherwise disposed of; second, the amounts and values of food purchased during the year were obtained from the farmer himself on a unit basis, such as per day, per year, etc.[1] For foods purchased it was necessary to rely mainly on the farmer's memory, since there were no written accounts. Lack of variety in the farm diet, however, and its sameness from year to year, make such verbal reports on the whole trustworthy. Indeed, the quantity of grain eaten per person or family per year is in many regions so well-known that it has become a local adage. For instance, in Su Hsien, Anhwei, it is commonly said, "One person (average of children and adults) requires three tou of grain each month" (大口小口一月三斗). The amounts of other things eaten, such

[1]The accuracy of this method of obtaining information depends largely upon the investigator, who must ask questions in terms of the farmer's own thinking; for instance, if the farmer is in the habit of purchasing cooking oil once in every ten days the investigator makes his inquiry with this unit rather than that of a month or year.

as oils, salt, meat, and so forth, may be estimated because these articles are used regularly in fairly invariable quantities.

The information for this study was collected from 1070 farm households, mostly of the large family type, in six hsiens and four provinces. These are in Yenshan Hsien (1922), Chihli, Sincheng and Kaifeng Hsiens, Honan, Su Hsien and Hwaiyuan Hsien, Anhwei, in North China, and in Kiangning Hsien (T), Kiangsu, East Central China.

AMOUNTS AND SOURCES OF FOODS

The proportion of total food consumed, by weight, for 1,070 families was 83.3 per cent for food furnished by the farm and 16.7 per cent for food purchased (tables 4-9 inclusive). The highest percentage supplied by the farm is 94 per cent in Hwaiyuan Hsien, Anhwei, and the lowest is 57 per cent in Kiangning Hsien, (T), Kiangsu. It is evident, therefore, that the farm is still the chief direct supply of food for the farm population.

The amount of food purchased depends on several factors. One of the most important is the custom, established by years of economic necessity, of selling foods of higher quality in order to purchase either larger quantities of cheaper foods of inferior quality or other essentials for the family. For instance, at Sincheng Hsien, Honan, over one-fifth of the kaoliang and a little less than one-fifth of the corn consumed were purchased. Something similar is true for farmers in Kaifeng Hsien, Honan, where about one-sixth of the kaoliang consumed is purchased. Kaoliang, millet, and corn are inferior food products as compared with wheat, and the farmers in Kaifeng Hsien as in most sections of North China, eat these inferior products in order that products bringing higher prices, such as wheat, may be sold.

Again, the amount of food purchased may depend on the crop year; if it is good, less food is needed from outside but if it is bad more must be bought. The farmers in Kiangning Hsien (T), Kiangsu, purchased 45 per cent of the total quantity of rice consumed, the reason being an abnormally poor crop year in which the harvest of rice was less than half a crop.

Besides these two factors, distance from markets may also influence the amount of food purchased, especially in the case of vegetables, fruits, meat, and bean curd and other things

not commonly grown on the farm. An example of this is Kiangning Hsien (T), Kiangsu, where also the largest quantity of the foods usually purchased, meat and eggs, was consumed annually to the amount of 57.4 kilograms per household. The largest quantity of fruit eaten annually is in Su Hsien, Anhwei, and amounts to 40 kilograms of watermelons. Fruit is not considered as food or as a part of the meal and if eaten it is done as a pastime—"to play" as the farmer says. For this reason it is not certain that all fruits eaten have been reported, but in any case the amount is small.

Fats for cooking are exclusively vegetable oils and little even of these are used in the country districts; the largest amount per household, for instance, is 19.5 kilograms annually in Kiangning Hsien (T), Kiangsu. The most common oils are made from sesame seeds, soybeans, and rapeseed.

Sugar is not an essential part of the diet and is supplied to a very limited extent by desultory eating of sweets between meals. This, however, is less usual in country districts where candy vendors are not as numerous as on the city streets. Most candy is made from malted grains. The largest amount of sugar consumed annually is 5.1 kilograms per household in Su Hsien, Anhwei.

The very limited production of vegetables for home use on these farms is surprising when one considers the economic advantage it would be to farmers to utilise their spare time in a vegetable garden, as well as the added advantage of good health from an improved diet. In traveling through the country districts of North China, especially, one is impressed with the absence of home gardens. In Su Hsien, Anhwei, where this holds true, farmers give the explanation for it in one *excuse* and in one *reason*. The excuse is that gardens are too much trouble. If the land is used for grain, such as wheat, one needs only to plough the ground, drill the wheat, and harvest the crop. There is no time, the farmer says, to plant vegetables. This is not a reason, because it is evident from the limited amount of work done and from the labor distribution that there is plenty of time at the farmer's disposal to grow vegetables for home use. A plausible and actual reason for the absence of home grown vegetables is the plea of ignorance of vegetable-growing methods. Vegetable growing, in North China more than in East Central China, is a specialized industry and grain

farmers feel ignorant of its intricacies. The few vegetables these farmers do buy are purchased from vegetable markets in cities or market towns, and these markets are supplied by vegetable growers who are invariably located near the cities. This condition results in grain farmers purchasing few vegetables because of the expense and other difficulties of getting to the market. The situation can only be changed by extension work showing the importance of the home garden to the farm business and to health, and by teaching farmers how to grow vegetables.

AMOUNT AND SOURCES OF FOOD ENERGY

The amount of food energy was calculated from the chemical compositions in table 1 and from the caloric values

TABLE 1. CHEMICAL COMPOSITION OF FOOD PRODUCTS CONSUMED

1070 farm households, six localities, four provinces, China (1922-1925)

KINDS OF PRODUCTS*	Per cent of protein	Per cent of carbohydrate	Per cent of fat
Animal Products:			
Chickens [5]	21.5	...	2.5
Donkeys [4]	32.2	...	11.4
Ducks [4]	17.4	...	26.1
Eggs (chicken) [1]	12.4	...	10.7
Eggs (duck) [1]	13.3	...	14.5
Fish (roach) [4]	19.5	...	3.7
Geese [4]	16.2	...	31.5
Mutton and goat [4]	29.0	...	26.8
Pork [4]	32.6	...	19.7
Fruits:			
Apricots [4]	1.1	12.4	...
Jujubes [7]	1.1	29.3	...
Muskmelons [5]	0.6	9.3	...
Peaches [4]	0.5	5.8	0.2
Pears [5]	0.6	14.1	0.5
Plums [5]	1.0	20.1	...
Pomegranates [5]	1.5	19.5	1.6
Watermelons [4]	0.3	6.5	0.1
Roots:			
Irish potatoes [5]	2.2	18.4	0.1
Sweet potatoes [3]	1.8	27.4	0.7
Taro [4]	0.3	6.1	...
Sugar:			
Cane sugar [4]	...	93.3	...
Molasses (malted barley) [5]	2.4	69.3	...

(Continued)

TABLE 1.—*(Continued)*

KINDS OF PRODUCTS	Per cent of protein	Per cent of carbohydrates	Per cent of fat
Seeds and their products:			
Grains:			
Barley [4]	5.1	81.9	1.0
Barley, hulless	8.5	77.8	1.1
Buckwheat [4]	9.2	73.3	1.8
Corn [1]	10.7	78.7	5.0
Kaoliang (red) [6]	9.5	72.5	4.7
Millet [1]	12.1	69.4	4.1
Proso millet [2]	10.2	71.7	3.4
Rice [4]	6.9	79.4	0.4
Rice (glutinous) [2]	7.6	76.0	1.9
Wheat [1]	12.1	75.2	1.8
Leguminous:			
Broad beans [4]	26.4	58.6	2.0
Cowpeas [5]	21.4	60.8	1.4
Green beans [6]	22.1	58.8	0.8
Vermicelli [6]	0.6	81.3	0.1
Red beans [6]	20.7	58.4	0.5
Soybeans (yellow) [6]	39.2	25.4	17.4
Soybeans (black) [6]	49.8	19.0	12.1
Soybean (curd) [6]	8.4	1.4	3.0
Peas (field) [2]	19.0	55.8	0.6
Peas (green) [4]	4.0	16.0	0.5
Peanuts [5]	25.8	24.4	38.6
Vegetable oils:			
Bean oil	...	...	95.0
Rape oil	...	...	95.0
Sesame oil	...	...	95.0
Vegetables:			
Bean sprouts [6]	11.5	6.0	3.5
Cabbage [6]	1.2	2.5	0.1
Carrots [6]	1.2	9.7	0.1
Celery [5]	1.1	3.3	0.1
Cucumbers [4]	0.8	2.1	0.1
Eggplant [5]	1.2	1.4	3.0
Leeks [4]	1.2	5.8	0.5
Onions (Welsh) [5]	1.6	9.9	0.3
Spinach [4]	2.5	3.8	0.5
Squash [5]	1.4	9.0	0.5
Winter radish (red) [6]	0.6	5.6	...

*Reference works used for the conversion of the various food products into calories are indicated in the footnotes.

1 Jordan, W. H. The principles of human nutrition. The MacMillan Company. 1912.

2 Henry and Morrison, Feeds and feeding. 16th ed. Henry-Morrison Company. 1916.

3 Sherman, Henry C., Food products. The MacMillan Company. 1918.

4 Hutchison, Robert, Food and dietetics. 4th ed. William Wood and Company. 1916.

5 Sherman, Henry C., Chemistry of food and nutrition. 2nd ed. The MacMillan Company. 1919.

6 Contribution from Peking Union Medical College, Vol. 1, 1921.

7 The Chinese Jujube, U.S.D.A., Bulletin 1215.

given for each product in table 2 and is given for each region in tables 4-9 inclusive. In some instances it was uncertain just what analysis should be used because the form in which the product is consumed may be different from available tables on chemical composition. Wheat flour, for instance, varies according to the type of milling. In some cases substitutions

TABLE 2. NUMBER OF CALORIES PRODUCED BY ONE KILOGRAM OF VARIOUS FOOD PRODUCTS*

1070 farm households, six localities, four provinces, China (1922-1925)

KINDS OF PRODUCTS	NUMBER OF CALORIES IN ONE KILOGRAM			
	Protein	Carbohydrate	Fat	Total
Animal Products:				
Chickens	860	...	225	1085
Donkeys	1288	...	1026	2314
Ducks	696	...	2349	3045
Eggs (chicken)	496	...	963	1459
Eggs (duck)	532	...	1305	1837
Fish (roach)	780	...	333	1113
Geese	648	...	2835	3483
Mutton and goat	1160	...	2412	3572
Pork	1304	...	1773	3077
Fruits:				
Apricots	44	496	...	540
Jujubes	44	1172	...	1216
Muskmelons	24	372	...	396
Peaches	20	232	18	270
Pears	24	564	45	633
Plums	40	804	...	844
Pomegranates	60	780	144	984
Watermelons	12	260	9	281
Roots:				
Irish potatoes	88	736	9	833
Sweet potatoes	72	1096	63	1231
Taro	12	244	...	256
Sugar:				
Cane sugar	...	3732	...	3732
Molasses (malted barley)	96	2772	...	2868
Seeds and their products:				
Grains:				
Barley	204	3276	90	3570
Barley, hulless	340	3112	99	3551
Buckwheat	368	2932	162	3462
Corn	428	3148	450	4026
Kaoliang (red)	380	2900	423	3703
Millet	484	2776	369	3629
Proso millet	408	2868	306	3582
Rice	276	3176	36	3488
Rice (glutinous)	304	3040	171	3515
Wheat	484	3008	162	3654

(Continued)

TABLE 2.—*(Continued)*

KINDS OF PRODUCTS*	NUMBER OF CALORIES IN ONE KILOGRAM			
	Protein	Carbohydrate	Fat	Total
Leguminous:				
Broad beans	1056	2344	180	3580
Cowpeas	856	2432	126	3414
Green beans	884	2352	72	3308
Vermicelli	24	3252	9	3285
Red beans	828	2336	45	3209
Soybeans (yellow)	1568	1016	1566	4150
Soybeans (black)	1992	760	1089	3841
Soybean (curd)	336	56	270	662
Peas (field)	760	2232	54	3046
Peas (green)	160	640	45	845
Peanuts	1032	976	3474	5482
Vegetables oils:				
Bean oil	...	...	8550	8550
Rape oil	...	...	8550	8550
Sesame oil	...	...	8550	8550
Vegetables:				
Bean sprouts	460	240	315	1015
Cabbage	48	100	9	157
Carrots	48	388	9	445
Celery	44	132	9	185
Cucumbers	32	84	9	125
Leeks	48	232	45	325
Onions	64	396	27	487
Spinach	100	152	45	297
Squash	56	360	45	461
Winter radish (red)	24	224	...	248

*Calculations were made by use of the chemical compositions given in table 1 and by use of the following:—

One gram carbohydrates is equivalent to 4.0 calories.

One gram fats is equivalent to 9.0 calories.

One gram proteins is equivalent to 4.0 calories.

were made for certain products, such as corn oil values for those of sesame and bean oil. On the other hand, in Yenshan Hsien, Chihli, it was necessary to omit entirely the seed of *Artemisia scoparia,* a wild, alkali-soil plant, for which no analysis is available. In other instances it was difficult to determine the exact amount of waste to products used (table 3). It is probable, however, that in spite of such difficulties the results closely approximate actual conditions.

A classification of the sources of food energy reveals that nine-tenths of such energy is from seeds and their products, and nearly nine per cent from roots, mostly sweet potatoes,

TABLE 3. PROPORTION OF EACH PRODUCT ELIMINATED AS WASTE*

1070 farm households, six localities, four provinces, China (1922-1925)

KINDS OF PRODUCTS†	Hwai-yuan Hsien, Anhwei (per cent)	Su Hsien Anhwei (per cent)	Sin-cheng Hsien, Honan (per cent)	Kaifeng Hsien, Honan (per cent)	Kiang-ning Hsien (T), Kiangsu (per cent)	Yen-shan Hsien, Chihli (per cent)	Average (per cent)
Animal Products:							
Chickens (young)	...	41.2	...	20.0	...	...	30.6
„ (adult)	20.0	38.2	0	20.0	20.0	11.0	18.2
Donkeys	...	0	...	25.0	...	...	12.5
Ducks (young)	...	20.0	...	...	...	...	20.0
„ (adult)	...	22.2	...	...			22.2
Eggs (chicken)	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Eggs (duck)	11.3	11.3	...	...	11.3	...	11.3
Fish	21.4	11.8	12.5	25.0	18.8	...	17.9
Geese	...	...	...	...	27.3	...	27.3
Mutton	...	0	0	25.0	...	...	8.3
Pork	28.6	17.6	...	25.0	25.0	0	19.2
Fruits:							
Apricots	53.8	...	25.0	...	44.4	...	41.1
Jujube	30.8	...	...	...	33.3	33.3	32.5
Muskmelons	53.8	...	...	12.5	33.3	...	33.2
Peaches	53.8	...	25.0	18.8	44.4	...	35.5
Pears	53.8	...	25.0	18.8	...	...	32.5
Plums	...	...	...	...	44.4	...	44.4
Pomegranates	53.8	...	...	...	44.4	...	49.1
Watermelons	53.8	...	25.0	12.5	38.9	...	32.4
Roots:							
Irish potatoes	...	18.8	...	...	...	...	18.8
Sweet potatoes	23.1	18.8	12.5	31.3	25.0	5.0	19.3
Taro	...	...	...	...	25.0	...	25.0
Sugar:							
Cane sugar	0	0	0	0	0	...	0
Molasses (barley)	...	0	...	...	...	...	0
Seeds and their products:							
Grains:							
Barley	11.8	6.9	15.0	16.7	0	...	10.1
Barley (hulless)	...	6.9	...	...	...	...	6.9
Buckwheat	...	23.1	25.0	...	...	...	24.1
Corn	...	...	16.7	17.1	10.3	0	11.0
Kaoliang (red)	5.3	17.9	22.7	22.9	...	4.0	14.6
Millet	20.0	20.0	31.8	28.6	...	4.0	20.9
Proso millet	...	21.7	...	31.0	...	...	26.4
Rice (hulled)	29.0	30.8	...	...	30.0	...	29.9
Rice (glutinous)	...	...	...	...	30.0	...	30.0
Wheat	23.8	20.0	20.0	21.1	17.8	16.7	19.9
Leguminous:							
Broad beans (dry or green)	...	...	...	...	25.0	...	25.0
Green beans	0	6.7	...	20.0	0	5.0	6.3
Cowpeas	...	...	...	...	0	...	0
Green bean vermicelli	...	...	...	...	...	...	...
Red beans	0	...	...	0	0	...	0
Soybeans (yellow)	0	30.0	15.0	...	0	5.0	10.0
Soybeans (black)	...	...	15.0	...	...	...	15.0
Soybean (curd)	...	...	...	...	...	...	...
Peas (field)	0	26.5	9.1	17.5	0	...	10.6
Peas (green)	...	...	...	...	...	5.0	5.0
Peanuts	28.6	25.0	25.0	...	...	...	26.2
Bean oil	0	...	...	...	...	...	0
Vegetable oils:							
Rape oil	...	...	0	...	...	...	0
Sesame oil	0	...	0	...	0	...	0
Vegetables:							
Bean sprouts	...	...	18.8	...	...	...	18.8
Cabbage	30.8	17.1	18.8	12.5	25.0	5.0	18.2
Carrots	30.8	17.1	18.8	12.5	...	5.0	16.8

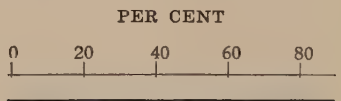
(Continued)

TABLE 3.—*(Continued)*

KINDS OF PRODUCTS†	Hwai-yuan Hsien, Anhwei (per cent)	Su Hsien Anhwei (per cent)	Sin-cheng Hsien, Honan (per cent)	Kaifeng Hsien, Honan (per cent)	Kiang-ning Hsien (T), Kiangsu (per cent)	Yen-shan Hsien, Chihli (per cent)	Ave-rage (per cent)
Celery	...	...	...	...	25.0	5.0	15.0
Cucumbers	...	...	...	...	25.0	5.0	15.0
Eggplant	...	...	...	...	..	5.0	5.0
Leeks	30.8	17.1	18.8	12.5	25.0	5.0	18.2
Onions	...	17.1	18.8	12.5	25.0	5.0	15.7
Spinach	30.8	...	18.8	12.5	25.0	...	21.8
Squash	30.8	0	...	...	25.0	5.0	15.2
Winter radish (red)	30.8	17.1	18.8	12.5	25.0	5.0	18.2

*Ciphers indicate no waste. No original data were obtained household by household for the edible portion of the various products and this has led to the necessity of asking the investigators to make an estimate or in a few instances to use data pertaining to analyses made in other countries. For the items of fish and chicken it does not seem reasonable that there should be such a variation. However, these foods are consumed in such minute quantities that the variation does not significantly affect the results. For vegetables and fruits there are several instances where the investigator reported only one percentage figure for non-edible portions of all fruits or vegetables regardless of kind. This figure is not ideal but still it seems best to use it rather than attempt to use edible portions as given by authorities for fruits and vegetables in other countries for the simple reason that some of the products vary a great deal in the amount of the edible portion. Take, for instance, peaches, which in China as a rule have a larger pit in proportion to the flesh than in the analyses for peaches in other countries. On the other hand, muskmelons in China are of an entirely different type from those in the West and are totally consumed in some regions except perhaps the thin skin. Products such as sweet potatoes may rot in holding them over and since the success of this varies with the region and the year the edible portion naturally also differs. Grains are eaten with differing proportions of outer covering and for this reason have varying percentages of the edible part. In the absence of more accurate data pertaining to proportions consumed, the method used appears to be the most practicable in spite of a few self-evident discrepancies on unimportant products.

(fig. 1 and table 10). Of seeds and their products grains constitute 77.8 per cent, legminous products (chiefly beans) 10.3 per cent, and vegetable oils 1.7 per cent of total energy for all products. The percentage for seeds and their products for the different regions varies from 76.8 to 97.4. Those regions



Seeds and their produts	89.8
Roots (mostly sweet potatoes)	8.5
Animal products	1.0
Vegetables	0.4
Sugar	0.2
Fruit	0.1

Fig. 1.—Sources of food energy.

1070 farm households, six hsiens four provinces, China (1922-1925).

having the smaller percentages of food energy from seeds and their products have larger percentages from roots. Food energy from roots varies from five-tenths of one per cent to 21.0 per cent. Those places having the smaller percentages from grains also have the larger percentages from legumes. Food energy from legumes varies from 2.1 to 22.0 per cent.

Very little energy is obtained from legumes by farm families in Hwaiyuan Hsien, Anhwei, in Sincheng Hsien, Honan, and in Kiangning Hsien (T), Kiangsu, where only a few per cent of the total crop hectare area are devoted to such legumes and where one-fifth to four-fifths of that produced, even, is sold. Apparently these farmers do not appreciate the value of leguminous foods in the diet.

The sources of food energy for farm families in China are quite different from those in the United States (fig. 2), where less than two-fifths of food energy is from seeds and their products, as compared with the nine-tenths in China. The American farmer receives 39 times as much food energy from animal products as does the Chinese farmer, 50 times as much from sugar, and 30 times as much from fruit. The amount

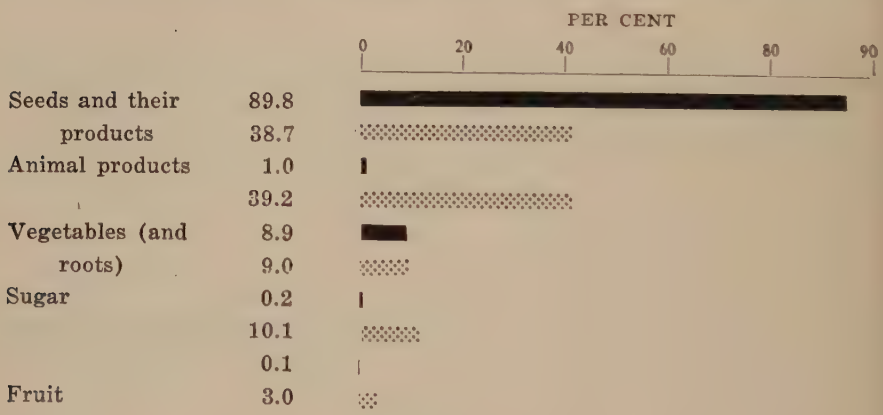


Fig. 2.—A comparison of sources of food energy for farm households in China with the typical family in the United States.

1070 farm households, six counties, four provinces, China (1922-1925).

224 representative urban and rural dietaries for a period of several years, U.S.A. (4), China U.S.A.

from vegetables, including root crops such as potatoes, is nearly the same for both groups.

A recommended distribution of calories for a very economical but healthful dietary for families in the United States (4) is as follows: food from cereal grain, 30-40 per cent; milk, 20-25 per cent; vegetables and fruit, 12-15 per cent; fats and oils, 10-12 per cent; sugar, 10-12 per cent, and meats, eggs, cheese, etc., 5-10 per cent. Only the localities in China which are using fairly large quantities of soybeans can be said to approach this desirable standard. Soybeans provide proteins and are a good substitute for milk. However, no locality studied approaches at all the desirable proportion of calories from fats and oils, sugar and meats, eggs and fish.

The extremely large percentage of food energy obtained from seeds and their products is the chief reason why the Chinese farmer can secure a living from such a small amount of land. His land utilization is very efficient in that it produces crops for direct consumption rather than through the intermediary step of feeding animals. In the United States 15 per cent of the land is used for wheat, sugar, and other foods, to produce 59 per cent of the food energy; 22 per cent of the land is used for dairy products to produce 17 per cent of the food energy; and 63 per cent of the land is used to produce meat, giving 24 per cent of the total food energy in calories (1). There is, therefore, a great difference between China and the United States in the amount of land required to produce an equivalent amount of food energy. Even in the United States, however, there is a downward trend in the amount of land devoted to raising animals and their products, and so whether or not China is producing too few animals for the best interests of health and national economy is still an open question.

Another reason for the subsistence in China from a small amount of land is the consumption of inferior products and the sale of the superior ones. Yenshan Hsien (1922), Chihli, is an illustration where products like kaoliang, corn, and millet are eaten and the superior food product, wheat, is sold. This is an extreme example of what happens in the same or less degree in most of the North China plain. The Su Hsien, Anhwei, farm families, for instance, raise field peas, or wheat and field peas in association, for home consumption and any land

TABLE 4. KIND, SOURCE, AND AMOUNT OF FOOD CONSUMED IN ONE YEAR

124 farm households*, Hwaiyuan Hsien, Anhwei, China (1925)

KINDS OF PRODUCTS†	Per cent of families having	Total quantity (waste eliminated) consumed per family (kilograms)	Furnished by the farm (per cent)	Purchased (per cent)	Total number calories for each product	Per cent of total calories for all products	Per cent of protein calories to total protein calories
Seeds and their products:‡							
Grains:							
Wheat	100.0	888.8	99.5	0.5	3,247,675	44.9	51.2
Kaoliang	99.2	534.3	98.4	1.6	1,978,513	27.3	24.2
Rice	91.9	334.8	100.0	...	1,167,782	16.1	11.0
Barley	48.4	26.0	100.0	...	92,820	1.3	0.6
Millet	26.6	6.2	100.0	...	22,500	0.3	0.4
Vegetable oils:							
Bean oil	100.0	10.3	...	100.0	88,065	1.2	...
Sesame oil	12.9	0.9	95.2	4.8	7,695	0.1	...
Leguminous:							
Green beans	33.9	30.2	100.0	...	99,902	1.4	3.2
Peas (field)	45.2	29.5	100.0	...	89,857	1.2	2.7
Peanuts	31.5	5.0	100.0	...	27,410	0.4	0.6
Soybeans	17.7	4.8	95.6	4.4	19,920	0.3	0.9
Red beans	2.4	2.9	100.0	...	9,306	0.1	0.3
Animal Products:							
Pork	93.5	9.3	5.2	94.8	28,616	0.4	1.5
Fish	64.5	3.8	...	100.0	4,229	0.1	0.4
Eggs (chicken)	44.4	2.0	84.3	15.7	2,918	...	0.1
Chickens	12.9	0.3	72.0	28.0	326	...	...
Eggs (duck)	0.8	0.1	100.0	...	184	...	...
Vegetables:	92.7						
Roots and tubers:							
Sweet potatoes	91.9	240.2	100.0	...	295,686	4.1	2.1
Winter radish (red)	...	64.1	...	...	15,897	0.2	0.2
Carrots	...	2.7	100.0	...	1,202	...	...
Leeks	...	0.4	...	100.0	130	...	...
Other vegetables:							
Squash‡	...	24.0	...	...	11,064	0.2	0.1
Cabbage‡	...	48.0	...	...	7,536	0.1	0.2
Spinach‡	...	24.0	...	...	7,128	0.1	0.3
Sugar:	75.8	3.0	...	100.0	11,196	0.2	...
Fruits:	57.3						
Pomegranates	...	2.8	13.5	86.5	2,755	...	...
Jujubes	...	0.2	100.0	...	243	...	...
Muskmelons	...	0.5	100.0	...	198	...	...
Peaches	...	0.5	100.0	...	135	...	...
Apricots	...	0.2	100.0	...	108	...	...
Pears	...	0.1	100.0	...	63	...	...
Watermelons	...	0.1	100.0	...	28	...	...
Total	...	*2,300.0*	*94.4*	*5.6*	*7,241,037*	*100.0*	*100.0*

*The total number of persons is 699 (including 54 hired men), which is equivalent to 542.6 adult-male units or 4.38 adult-male units, per household.

†Salt was purchased to the extent of 65.9 catties per household, and cost $4.13.

‡The quantities of winter radish, squash, cabbage, and spinach purchased are estimated to be over one-half of the total consumed.

TABLE 5. KIND, SOURCE, AND AMOUNT OF FOOD CONSUMED IN ONE YEAR

286 farm households*, Su Hsien, Anhwei, China (1924)

KINDS OF PRODUCTS†	Per cent of families having	Total quantity (waste eliminated) consumed per family (kilograms)	Furnished by the farm (per cent)	Purchased (per cent)	Total number of calories for each product	Per cent of total calories for all products	Per cent of protein calories to total protein calories
Seeds and their products:							
Grains:							
Wheat	93.0	352.8	83.9	16.1	1,289,131	21.3	21.1
Kaoliang	97.9	340.8	82.9	17.1	1,261,982	20.9	16.0
Barley	64.0	115.9	100.0	...	413,763	6.9	2.9
Millet	46.2	48.4	95.0	5.0	175,644	2.9	2.9
Rice	6.3	4.4	25.0	75.0	15,347	0.3	0.2
Proso millet	5.6	3.3	100.0	...	11,821	0.2	0.2
Buckwheat	1.4	2.4	100.0	...	8,309	0.1	0.1
Barley, hulless	0.7	1.6	100.0	...	5,682	0.1	0.1
Vegetable oils:							
Bean oil	97.9	10.8	...	100.0	92,340	1.5	...
Sesame oil	49.0	5.0	93.9	6.1	42,750	0.7	...
Leguminous:							
Peas (field)	79.7	326.6	100.0	...	994,824	16.5	30.7
Green beans	64.3	91.4	100.0	...	302,351	5.0	10.0
Peanuts	6.6	3.4	100.0	...	18,639	0.3	0.4
Soybeans	63.3	3.8	66.7	33.3	15,770	0.3	0.7
Animal Products:							
Pork	99.0	17.2	35.2	64.8	52,926	0.9	2.8
Eggs (chicken)	82.9	11.9	95.9	4.1	17,362	0.3	0.7
Fish	51.0	5.1	...	100.0	5,676	0.1	0.5
Chickens	38.5	1.4	93.5	6.5	1,519	...	0.1
Eggs (duck)	6.6	0.8	100.0	...	1,470	...	...
Mutton (goat)	2.4	0.4	100.0	...	1,429	...	0.1
Donkey	0.7	0.3	100.0	...	694	...	...
Vegetables:	99.0						
Roots and tubers:							
Sweet potatoes	93.4	975.3	99.6	0.4	1,200,594	19.9	8.7
Onions ‡	...	65.5	21.1	78.9	31,899	0.5	0.5
Leeks‡	...	65.5	21.1	78.9	21,288	0.4	0.4
Carrots	...	19.9	100.0	...	8,856	0.1	0.1
Irish potatoes	...	6.9	100.0	...	5,748	0.1	0.1
Winter radish (red)	...	5.8	100.0	...	1,438	...	...
Other vegetables:							
Cabbage ‡	...	87.4	21.1	78.9	13,722	0.2	0.5
Squash	...	15.4	100.0	...	7,099	0.1	0.1
Fruits:							
Watermelons	4.9	40.0	100.0	...	11,240	0.2	0.1
Sugar:	71.0	5.1	...	100.0	14,973	0.2	...
Total	...	*2,634.5*	*87.4*	*12.6*	*6,046,286*	*100.0*	*100.0*

*The total number of persons is 2,085 (including the 158 hired men), which is equivalent to 1624.5 adult-male units, or 5.68 adult-male units per household.

†Salt was purchased by 47.3 per cent of these households, costing $3.34 per household. Sauce was purchased by over one-fourth of these households, amounting to four catties, costing 32 cents per household. Vinegar was used by one-half the households, averaging 4.1 catties and costing 24 cents per household.

TABLE 6. KIND, SOURCE, AND AMOUNT OF FOOD CONSUMED IN ONE YEAR

150 farm households*, Yenshan Hsien, Chihli, China (1922)

KINDS OF PRODUCTS†	Per cent of families having	Total quantity (waste eliminated) consumed per family (kilograms)	Furnished by the farm (per cent)	Purchased (per cent)	Total number of calories for each product	Per cent of total calories for all products	Per cent of protein calories to total protein calories
Seeds and their products:‡							
Grains:							
Kaoliang	94.0	344.7	91.6	8.4	1,276,424	31.4	21.2
Millet	85.3	283.2	94.7	5.3	1,027,733	25.3	22.2
Corn	92.0	226.1	98.2	1.8	910,279	22.4	15.6
Wheat	99.3	45.9	100.0	...	167,719	4.1	3.6
Leguminous:							
Soybeans	97.3	135.1	87.8	12.2	560,665	13.8	34.3
Green beans	12.7	4.1	100.0	...	13,562	0.3	0.6
Peas (green)	5.3	2.8	...	100.0	2,366	0.1	0.1
Vegetables:†	93.3						
Roots and tubers:							
Carrots	...	42.8	...	100.0	19,046	0.5	0.3
Onions	...	27.0	...	100.0	13,149	0.3	0.3
Winter radish	...	48.1	...	100.0	11,929	0.3	0.2
Leeks	...	16.2	...	100.0	5,265	0.1	0.1
Sweet potatoes	4.7	4.2	12.0	88.0	5,170	0.1	...
Other vegetables:							
Squash	...	32.4	...	100.0	14,936	0.4	0.3
Eggplant	...	21.7	...	100.0	8,116	0.2	0.2
Cabbage	...	32.4	...	100.0	5,087	0.1	0.2
Cucumbers	...	34.5	...	100.0	4,313	0.1	0.2
Celery	...	10.0	...	100.0	1,850	0.1	0.1
Fruits:							
Jujubes	6.7	7.3	80.0	20.0	8,877	0.2	...
Animal Products:							
Eggs	56.0	2.4	100.0	...	3,501	0.1	0.2
Pork	10.0	1.0	...	100.0	3,077	0.1	0.2
Chickens	24.7	0.7	100.0	...	760	...	0.1
Total	...	*1,322.6*	*74.4*	*25.6*	*4,063,825*	*100.0*	*100.0*

*The total number of persons is 808 (including 5 hired men), which is equivalent to 613.5 adult-male units, or 4.09 adult-male units, per household.

†Only two households purchased salt, because most of the salt used is obtained from the alkali spots of the region.

‡The seed and green leaves of *Artemisia scoparia*, gathered from public alkali spots, have not been included.

not needed for this purpose or for barley is planted to the cash crop, wheat. Wheat flour is considered a much better food than pea flour or wheat and pea flour mixed, but the production is greater per unit of land for either peas, or wheat and peas in association, than it is for wheat, and for this reason, chiefly, more wheat is not consumed. That the Su Hsien farmers of

TABLE 7. KIND, SOURCE, AND AMOUNT OF FOOD CONSUMED PER HOUSEHOLD IN ONE YEAR

144 farm households*, Sincheng Hsien, Honan, China (1923)

KINDS OF PRODUCTS†	Per cent of families having	Total quantity (waste eliminated) consumed per family (kilograms)	Furnished by the farm (per cent)	Purchased (per cent)	Total number of calories for each product	Per cent of total calories for all products	Per cent of protein calories to total protein calories
Seeds and their products:							
Grains:							
Wheat	100.0	801.9	99.7	0.3	2,930,143	37.6	38.4
Kaoliang	99.3	296.1	77.8	22.2	1,096,458	14.1	11.1
Millet	100.0	284.8	96.5	3.5	1,033,539	13.3	13.6
Corn	99.3	217.7	82.5	17.5	876,460	11.3	9.2
Buckwheat	34.7	56.2	100.0	...	194,564	2.5	2.1
Barley	81.9	31.9	100.0	...	113,883	1.5	0.7
Vegetable oils:							
Sesame oil	88.9	11.0	98.2	1.8	94,050	1.2	...
Rape oil	31.9	2.4	...	100.0	20,520	0.3	...
Leguminous:							
Soybeans (black)	89.6	68.9	100.0	...	264,645	3.4	13.6
Soybean curd	29.9	39.9	100.0	...	26,413	0.3	1.3
Vermicelli	70.1	26.7	100.0	...	87,710	1.1	0.1
Soybeans	29.9	12.3	83.3	16.7	51,045	0.7	1.9
Peanuts	3.5	2.6	100.0	...	14,253	0.2	0.3
Peas (field)	1.4	1.2	100.0	...	3,655	...	0.1
Animal Products:							
Pork	97.2	13.8	58.4	41.6	42,463	0.5	1.8
Chickens	91.0	5.1	99.3	0.7	5,534	0.1	0.4
Eggs	100.0	0.3	100.0	...	438	...	...
Mutton	0.7	0.2	100.0	...	714	...	...
Fish	1.4	0.1	...	100.0	111	...	...
Vegetables:‡	97.9						
Roots and tubers:							
Sweet potatoes	97.2	707.4	100.0	...	870,809	11.2	5.1
Onions	...	13.9	...	...	6,769	0.1	0.1
Leeks	...	13.9	...	...	4,518	0.1	0.1
Winter radish (red)	...	7.0	...	...	1,736	...	...
Carrots	...	3.5	...	...	1,558	...	...
Other vegetables:							
Cabbage	...	27.9	...	...	4,380	0.1	0.1
Spinach	...	2.8	...	...	832	...	...
Bean sprouts	...	0.7	...	...	711	...	...
Fruits:	52.1						
Pears	...	8.1	100.0	...	5,127	0.1	...
Apricots	...	8.1	100.0	...	4,374	0.1	...
Watermelons	...	8.1	100.0	...	2,276	...	...
Peaches	...	2.8	100.0	...	756	...	...
Sugar:	98.6	3.7	...	100.0	13,809	0.2	...
Total	...	*2,681.0*	*92.8*	*7.2*	*7,774,253*	*100.0*	*100.0*

*The total number of persons is 1,029 (including 25 hired men), which is equivalent to 797.1 adult-male units, or 5.54 adult-male units per household.

†Salt was purchased by these households to the amount of 50.3 catties per household, at an average cost of $2.34.

‡About seven-eights of these vegetables are estimated as purchased.

TABLE 8. KIND, SOURCE, AND AMOUNT OF FOOD CONSUMED PER HOUSEHOLD IN ONE YEAR

149 farm households*, Kaifeng Hsien, Honan, China (1923)

KINDS OF PRODUCTS†	Per cent of families having	Total quantity (waste eliminated) consumed per family (kilograms)	Furnished by the farm (per cent)	Purchased (per cent)	Total number of calories for each product	Per cent of total calories for all products	Per cent of protein calories to total protein calories
Seeds and their products:							
Grains:							
Wheat	100.0	812.7	99.8	0.2	2,969,606	31.1	30.9
Kaoliang (red)	99.3	602.5	82.7	17.3	2,231,058	23.4	18.0
Millet	97.3	293.7	83.5	16.5	1,064,820	11.2	11.2
Barley	95.3	72.6	100.0	...	259,182	2.7	1.2
Proso millet	79.2	44.8	100.0	...	160,474	1.7	1.5
Corn	75.8	43.8	96.0	4.0	176,339	1.8	1.5
Vegetable oils:							
Sesame oil	100.0	9.9	22.2	77.8	84,645	0.9	...
Leguminous:							
Green beans	100.0	272.9	100.0	...	902,753	9.5	19.0
Soybeans	99.3	51.6	100.0	...	214,140	2.2	6.4
Vermicelli	100.0	40.6	100.0	...	133,371	1.4	0.1
Soybean curd	99.3	95.9	100.0	...	63,486	0.7	2.5
Red beans	33.6	9.4	100.0	...	30,165	0.3	0.6
Peas (field)	2.7	2.0	100.0	...	6,092	0.1	0.1
Animal Products:							
Pork	92.6	9.8	...	100.0	30,155	0.3	1.0
Eggs	100.0	3.2	100.0	...	4,669	...	0.1
Chickens	91.9	1.9	100.0	...	2,062	...	0.1
Fish	2.0	0.1	...	100.0	111	...	...
Vegetables: ‡	64.4						
Roots and tubers:							
Sweet potatoes	100.0	931.9	100.0	...	1,147,169	12.0	5.3
Winter radish	...	70.6	...	...	17,509	0.2	0.1
Carrots	...	35.3	...	...	15,709	0.2	0.1
Onions	...	17.6	...	...	8,571	0.1	0.1
Leeks	...	8.8	...	...	2,860	...	...
Other vegetables:							
Cabbage	...	35.3	...	...	5,542	0.1	0.1
Spinach	...	8.8	...	...	2,614	...	0.1
Fruits:	22.1						
Pears	...	14.0	100.0	...	8,862	0.1	...
Watermelons	...	9.2	100.0	...	2,585	...	...
Muskmelons	...	5.0	100.0	...	1,980	...	...
Peaches	...	1.0	100.0	...	270	...	...
Sugar:	100.0	1.0	...	100.0	3,732	...	...
Total	...	*3,505.9*	*93.9*	*6.1*	*9,550,531*	*100.0*	*100.0*

*The total number of persons is 1,166 (excluding hired men), which is equivalent to 854.6 adult male-units, or 5.74 adult-male units per household.

†All families purchased an average of 117.4 catties of salt at a value of $2.95 per family. A catty and a half of sauce was also purchased at a value of eight cents per household.

‡About one-fifth of these vegetables are estimated as purchased.

TABLE 9. KIND, SOURCE, AND AMOUNT OF FOOD CONSUMED PER HOUSEHOLD IN ONE YEAR

217 farm households*, Kiangning Hsien (T) Kiangsu, China (1924)

KINDS OF PRODUCTS†	Per cent of families having	Total quantity (waste eliminated) consumed per family (kilograms)	Furnished by the farm (per cent)	Purchased (per cent)	Total number of calories for each product	Per cent of total calories for all products	Per cent of protein calories to total protein calories
Seeds and their products:							
Grains:							
Rice	100.0	835.3	54.8	45.2	2,913,526	75.1	60.1
Wheat	100.0	87.6	98.7	1.3	320,090	8.3	11.1
Corn	24.4	45.6	95.2	4.8	183,586	4.7	5.1
Barley	4.1	4.9	100.0	...	17,493	0.5	0.3
Rice (glutinous)	7.4	2.1	100.0	...	7,382	0.2	0.2
Vegetable oils:							
Bean oil	100.0	19.0	...	100.0	162,450	4.2	...
Sesame oil	38.2	0.5	64.1	35.9	4,275	0.1	...
Leguminous:							
Broad beans	35.0	7.5	100.0	...	26,850	0.7	2.1
Soybeans	88.5	5.4	100.0	...	22,410	0.6	2.2
Peas (field)	19.4	7.2	100.0	...	21,931	0.6	1.4
Cowpeas	5.1	2.0	100.0	...	6,828	0.2	0.4
Green beans	1.8	0.7	100.0	...	2,316	0.1	0.2
Red beans	2.8	0.3	100.0	...	963	...	0.1
Animal Products:							
Pork	100.0	28.2	58.4	41.6	86,771	2.2	9.6
Fish	99.5	15.1	1.0	99.0	16,806	0.4	3.1
Eggs (chicken)	99.1	9.3	99.7	0.3	13,569	0.3	1.2
Geese	24.4	1.2	100.0	...	4,180	0.1	0.2
Chickens	96.8	2.9	100.0	...	3,147	0.1	0.6
Ducks	19.8	0.6	5.0	95.0	1,827	...	0.1
Eggs (duck)	0.5	0.1	100.0	...	184	...	...
Vegetables:‡	99.1						
Roots and tubers:							
Leeks	...	24.0	...	...	7,800	0.2	0.3
Winter radish (red)	...	16.2	...	...	4,018	0.1	0.1
Sweet potatoes	5.1	3.0	100.0	...	3,693	0.1	0.1
Onions	...	3.2	...	...	1,558	...	0.1
Taro	...	0.1	100.0	...	26	...	...
Other vegetables:							
Cabbage	...	64.1	...	...	10,064	0.3	0.8
Squash	...	16.0	...	...	7,376	0.2	0.2
Celery	...	16.0	...	...	2,960	0.1	0.2
Cucumbers	...	16.0	...	...	2,000	0.1	0.1
Spinach	...	4.8	...	...	1,426	...	0.1
Sugar:	80.6	3.8	...	100.0	14,182	0.4	...
Fruits:	48.4						
Peaches	...	7.2	97.4	2.6	1,944	0.1	...
Watermelons	...	5.7	100.0	...	1,602	...	...
Pomegranates	...	0.3	100.0	...	295	...	...
Jujubes	...	0.2	100.0	...	243	...	...
Plums	...	0.2	100.0	...	169	...	...
Apricots	...	0.2	100.0	...	108	...	...
Muskmelons	...	0.2	100.0	...	79	...	...
Total	...	*1,256.7*	*56.8*	*43.2*	*3,876,127*	*100.0*	*100.0*

*The total number of persons is 1,447 (including 22 hired men), which is equivalent to 1,059 adult-male units, or 4.88 adult-male units per household.

†Salt was purchased by these families to the extent of 41.5 catties, costing $2.84 per household. Sauce was purchased by nearly three-fourths of the households, amounting to 5.6 catties at a cost of $0.56 per family.

‡About two-thirds of these vegetables are estimated as purchased.

TABLE 10. PROPORTION OF CALORIES FROM DIFFERENT CLASSES OF FOOD

1070 farm households, six localities, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Seed and their products			Vegetables		Animal products	Fruit	Sugar	Total
	Grains	Leguminous	Vegetable oils	Roots and tubers	Other vegetables				
Anhwei:									
Hwaiyuan	89.9	3.4	1.3	4.3	0.4	0.5	...	0.2	100
Su	52.6	22.0	2.2	21.0	0.4	1.3	0.2	0.3	100
Chihli:									
Yenshan (1922)	83.2	14.2	...	1.4	0.8	0.2	0.2	...	100
Honan:									
Sincheng	80.3	5.8	1.5	11.3	0.1	0.6	0.2	0.2	100
Kaifeng	71.9	14.1	0.9	12.5	0.1	0.4	0.1	...	100
Kiangsu:									
Kiangning (T) ..	88.8	2.1	4.3	0.5	0.6	3.3	0.1	0.3	100
Average	*77.8*	*10.3*	*1.7*	*8.5*	*0.4*	*1.0*	*0.1*	*0.2*	*100*

*With the exception of one-tenth of one per cent for Irish potatoes at Su Hsien all the other percentages for roots are for sweet potatoes.

Anhwei would prefer to eat wheat rather than field peas is shown by the fact that the farmers on the farms in the largest size-group of farms, who have significantly greater family earnings per adult-male unit, are eating a smaller quantity of peas than the farmers in the smaller sized groups of farms. The farms in the size groups of 40-49.9 and of 100-124.9 mow have the same number of mow devoted to field peas, and wheat and field peas, but in spite of the larger farms in the latter group, the yields are about one-fourth smaller.

The food energy (in calories) consumed per adult-male unit averaged 3461 for the six localities (table 11). It was highest

TABLE 11. THE NUMBER OF CALORIES CONSUMED DAILY PER ADULT-MALE UNIT

1070 farm households, six localities, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Number of calories per adult-male unit
Anhwei:	
Hwaiyuan	2916
Su	4529
Chihli:	
Yenshan (1922)	2742
Honan:	
Kaifeng	4559
Sincheng	3845
Kiangsu:	
Kiangning (T)	2176
Average	*3461*

in Kaifeng Hsien, Honan, 4559, and lowest in Kiangning Hsien (T), Kiangsu, 2176. These variations may be caused by habits of eating much or little, or by good or low crop yields. In good years much more is eaten than the body requires while in years of crop failure or very low yields starvation rations prevail. Climate does not appear to be a cause of the variation in amounts consumed, since significant differences occur within the limits of the same type of climate. Absence of information on weights of individuals and exact amounts of work accomplished per individual make it impossible to indicate the effect of these two factors.

The average food energy of 3461 calories per adult-male unit may be compared with the Western requirement of 3400 calories per day for a man doing moderate manual work (2). Presumably a Chinese farmer would require less because of his lighter weight. The study for these six localities indicates that there is considerable variation in amount of food energy and that the farmers in some regions are living on a bare subsistence basis while in others more energy is consumed than perhaps is required. Adolph, in his studies of North China summer dietaries, found a consumption of 3356 calories for twenty middle class farm families and 2471 calories for another group of 30 farm families (3).

AMOUNTS AND SOURCES OF PROTEIN

The proportion of food energy from protein calories is 12.7 per cent for the six localities and compares favorably with the accepted standard of 10-15 per cent of total food energy from protein (table 12) (2).

Although the quantity of protein eaten is sufficient, the question arises whether or not the protein itself is from sources producing the best health. Except in Kiangning Hsien (T), Kiangsu, over 96 per cent is from seeds and their products.

Soybeans are a good source of protein, but the proportion of protein from these is small for most localities. Farmers in Yenshan Hsien, Chihli, are exceptional in that 34 per cent of their proteins is supplied by soybeans. Farm households in Hwaiyuan Hsien, Anhwei, and Su Hsien, Anhwei, have less than one per cent of proteins from soybeans, and at the same time less than five per cent of proteins from animal products.

TABLE 12. AMOUNT OF PROTEIN AND PROPORTION OF PROTEIN AND CALORIES TO THE TOTAL FOOD ENERGY

1070 farm households, six localities, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Grams of protein per adult-male unit compared with standard of 75 grams	Percentage compard with the accepted standard of 10-15 per cent*
Anhwei:		
Hwaiyuan	148.3	11.6
Su	99.7	13.4
Chihli:		
Yenshan (1922)	98.1	15.2
Honan:		
Kaifeng	143.4	13.3
Sinchen	124.0	13.0
Kiangsu:		
Kiangning (T)	57.0	9.9
		12.7

*Sherman, Henry C., Chemistry of food and nutrition, third edition, page 531. The protein standards given by Sherman are: Voigt, Playfair, and Gautier, about 16 per cent of the fuel value of the food; Atwater, about 15 per cent; Longworthy, 12 per cent; Chittenden, 8½ per cent.

In Kiangning Hsien (T), Kiangsu, where only 6.4 per cent of protein calories was from legumes, 14.8 per cent was from animal products. Cereals afford an economical source of proteins, but authorities state that the animo-acids as found in certain legumes, such as soybeans, or in animal products give greater nutritive efficiency. With the present farm organization, however, probably consumption of leguminous products can be more easily increased than that of animal products.

Greater amounts of such animal foods as eggs and dairy products introduced as a new industry would diversify farming, but might be less economical of the land, except in a very limited way. While it remains to be proved that all the necessary essentials of a good diet can be obtained from the vegetable kingdom, still the evidence points to such a probability. If so, then the advantages to be had from the raising of animals depend largely upon their economical utilization of by-products and on their place in soil fertility maintenance.

VITAMINS

Only an approximation can be made in regard to the sufficiency of vitamins in the diet (table 13 and fig. 3).

For the six localities vitamin A is found in 410 kilograms of food products compared with vitamin B in 420 kilograms

TABLE 13. WEIGHT (in kg.) OF PRODUCTS, CONSUMED PER HOUSEHOLD CONTAINING THE SPECIFIED VITAMINS

1070 farm households, six localities, four provinces, China (1922-1925)

Classification of products for different localities	Kind of vitamins									Unknown
	A +	A ++	A +++	B +	B ++	B +++	C +	C ++	C +++	
Hwaiyuan Hsien, Anhwei										
Seeds and their products	1870.8	...	...	30.2	1824.6	4.8	...	...	...	2.9
Roots*	...	240.2	...	...	240.2	...	...	240.2	...	...
Animal products	...	...	2.1	5.9	...	...	...	...	...	9.6
Vegetables	48.0	24.0	26.7	64.1	50.7	24.0	50.7	24.5	...	3.4
Fruits	0.5	...	...	0.6	...	...	...	0.5	...	3.8
Total per household	*1919.3*	*264.2*	*28.8*	*100.8*	*2115.5*	*28.8*	*50.7*	*265.2*	...	*19.7*
Average per adult-male unit	*438.2*	*60.3*	*6.6*	*23.0*	*483.0*	*6.6*	*11.6*	*60.5*	...	*4.5*
Su Hsien, Anhwei										
Seeds and their products	1310.6	...	...	91.4	1199.6	3.8	...	...	...	...
Roots*	6.9	975.3	...	...	982.2	...	...	982.2	...	...
Animal products	...	...	12.7	17.8	0.4	...	...	...	...	18.9
Vegetables	87.4	15.4	19.9	71.3	107.3	...	172.8	...	...	105.5
Fruits	...	...	...	...	...	...	...	...	...	...
Total per household	*1404.9*	*990.7*	*32.6*	*180.5*	*2289.5*	*3.8*	*172.8*	*982.2*	...	*124.4*
Average per adult-male unit	*247.3*	*174.4*	*5.7*	*31.8*	*403.1*	*0.7*	*30.4*	*172.9*	...	*21.9*
Yenshan Hsien, Chihli (1922)										
Seeds and their products	1039.1	2.8	...	4.1	902.7	135.1	...	...	2.8	...
Roots*	...	4.2	...	...	4.2	...	...	4.2	...	...
Animal products	...	...	2.4	2.4	...	...	...	...	...	1.7
Vegetables	54.1	42.4	42.8	131.3	75.2	10.0	136.7	...	...	23.5
Fruits	...	...	...	...	...	...	...	...	...	...
Total per household	*1093.2*	*49.4*	*45.2*	*137.8*	*982.1*	*145.1*	*136.7*	*4.2*	*2.8*	*25.2*
Average per adult-male unit	*267.3*	*12.1*	*11.1*	*33.7*	*240.1*	*35.5*	*33.4*	*1.0*	*0.7*	*6.2*
Sincheng Hsien, Honan										
Seeds and their products	1718.1	...	...	...	1692.4	12.3	...	...	...	135.5
Roots*	...	707.4	...	...	707.4	...	...	707.4	...	...
Animal products	...	...	0.3	0.4	0.2	...	...	...	...	18.9
Vegetables	28.6	...	6.3	20.9	32.1	2.8	45.3	3.5	...	13.9
Fruits	2.8	...	...	10.9	...	...	...	2.8	...	16.2
Total per household	*1749.5*	*707.4*	*6.6*	*32.2*	*2432.1*	*15.1*	*45.3*	*713.7*	...	*184.5*
Average per adult-male unit	*315.8*	*127.7*	*1.2*	*5.8*	*439.0*	*2.7*	*8.2*	*128.8*	...	*33.3*
Kaifeng Hsien, Honan										
Seeds and their products	2206.7	...	...	272.9	1872.3	51.6	...	...	...	145.9
Roots*	...	931.9	...	...	931.9	...	...	931.9	...	...
Animal products	...	...	3.2	3.2	...	...	...	...	...	11.7
Vegetables	35.3	...	44.1	88.2	70.6	8.8	88.2	8.8	...	8.8
Fruits	1.0	...	...	15.2	...	...	...	1.0	...	14.2
Total per household	*2243.0*	*931.9*	*47.3*	*379.5*	*2874.8*	*60.4*	*88.2*	*941.7*	...	*180.6*
Average per adult-male unit	*390.8*	*162.4*	*8.2*	*66.1*	*500.8*	*10.5*	*15.4*	*164.1*	...	*31.5*

(Continued)

TABLE 13.—*(Continued)*

Classification of products for different localities	Kind of vitamins									Unknown
	A +	A ++	A +++	B +	B ++	B +++	C +	C ++	C +++	
Kiangning Hsien (T), Kiangsu										
Seeds and their products ..	1008.3	...	...	0.7	982.7	5.4	...	...	...	9.8
Roots*	...	3.0	...	...	3.0	...	...	3.0	...	0.1
Animal products	...	...	9.4	24.5	...	...	...	...	...	32.9
Vegetables	64.1	32.0	4.8	35.4	64.1	20.8	83.3	4.8	...	24.0
Fruits	7.2	...	...	7.2	...	...	...	7.2	...	6.8
Total per household	*1079.6*	*35.0*	*14.2*	*67.8*	*1049.8*	*26.2*	*83.3*	*15.0*	...	*73.6*
Average per adult-male unit ..	*221.2*	*7.2*	*2.9*	*13.9*	*215.1*	*5.4*	*17.1*	*3.1*	...	*15.1*
Average per household, by six localities	*1581.6*	*496.4*	*29.1*	*149.8*	*1957.3*	*46.6*	*96.2*	*48.7*	*0.5*	*97.1*
Average per adult-male unit, by six localities	*313.8*	*90.7*	*5.9*	*29.1*	*380.5*	*10.3*	*17.7*	*33.4*	*0.1*	*19.2*

*Almost entirely sweet potatoes.

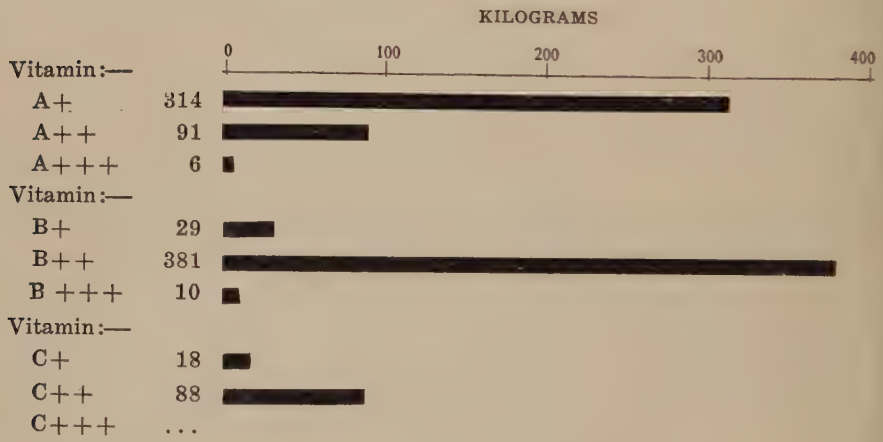


Fig. 3.—Vitamins consumed per adult-male unit according to weight of products.

1076 farm households, six localities, four provinces, China (1922-1925).

and with vitamin C in 106 kilograms per adult-male unit per year. Sweet potatoes are the chief source of vitamin C++. Possibly they constitute an adequate supply of Vitamin C for those localities consuming large quantities. For this reason and that of the large amount of food energy produced per unit of land

important consideration should be given to sweet potatoes in the cropping system.

Only one-tenth of one kilogram of products supply vitamin C+++, 5.9 kilograms supply vitamin A+++, and there are only 10.3 kilograms of products from which vitamin B+++ may be obtained.

Vitamin A is probably insufficient, chiefly because either semi-polished rice or semi-white wheat flour is used instead of whole rice or whole wheat, and because of the small amount of vegetables and fruits consumed. To what extent this vitamin may be supplied by other grains is a question. The germ of grain is the chief source of vitamin A, and for this reason it is important that any refining should not be of such a nature as to remove it. There is very little of vitamin A in the endosperm. Vitamin C is insufficient because of too small quantities of fruits and vegetables in the diet. It could be easily supplied by the use of more bean sprouts, an excellent source of vitamin C. The eating of uncooked roots, such as carrots, sweet potatoes, and radishes, as is sometimes done, helps to supply needed vitamins. Consumption of whole grains, rather than those from which the outer covering has been removed, would probably be more economical, and certainly would contribute to better health. Vitamin B appears to be adequately supplied. The production and consumption of more fruits and vegetables would intensify farming and would supply the additional work so greatly needed on most farms, at the same time improving health.

MINERAL CONSTITUENTS

It is difficult to determine whether or not the mineral constituents in the diet are sufficient for health requirements, because there are inadequate mineral analyses for some of the food products in China. The results of computation from analysis of similar products in the United States (5) (6) and from products likely to have nearly the same mineral composition are given in table 14. The most important substitutions are kafir corn for kaoliang, and kidney, lima and navy beans for soybeans. Apparently phosphorous is adequate and iron nearly so; but there is a distinct shortage of calcium. The consumption of larger quantities of green vegetables and soybeans would supply the required amounts of calcium and iron and at

TABLE 14. MINERAL CONSTITUENTS FROM DIFFERENT CLASSES OF FOOD.

1070 farm households, six localities, China (1922-1925).

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Calcium (grams)	Phosphorous (grams)	Iron (grams)
Anhwei			
Hwaiyuan	0.343860	2.659101	0.0222924
Su	0.434598	2.153322	0.0124362
Chihli			
Yenshan (1922) ..	0.329651	2.009413	0.0117887
Honan			
Sincheng	0.379236	2.519668	0.0186902
Kaifeng	0.476117	2.941949	0.0213752
Kiangsu			
Kiangning (T) ..	0.122047	0.761105	0.0077154
Average	0.35	2.17	0.016
Standard	0.68	1.32	0.015

the same time would improve the protein and vitamin content of the diet. The use of less refined cereals and of white potatoes and eggs would also add iron to the diet.

DIETARIES

There is little variety in the diets, and hence a few products are consumed in large quantities. The only products supplying ten per cent or more of the total food energy are kaoliang, wheat, millet, corn, beans (or peas in Su Hsien, Anhwei), sweet potatoes, and rice (in Hwaiyuan Hsien, Anhwei). At Su Hsien, sweet potatoes grown on 2.5 per cent of the crop area supplied one-fifth of the total energy and this is indicative of the pressure of population upon subsistence in that region generally known as one having a low standard of living. Kaoliang bread is usually eaten as hardtack and can scarcely be considered palatable. Often a winter meal consists of only a bowl of hot soup made of sweet potatoes, kaoliang flour, and water.

In Kiangning Hsien (T), Kiangsu, rice supplies 75 per cent of the food energy and this percentage is typical of the source of energy in rice growing districts.

Dietaries are chiefly seasonal in nature and in North China show clearly a hand-to-mouth existence. In North China autumn and winter and early spring diets consist of such foods as millet, kaoliang, corn, and sweet potatoes harvested in late summer or in the autumn. The first chief change in the spring diet comes with the harvesting of barley and the next change with the harvesting of wheat. This hand-to-mouth existence works very well in normal years; but in years of low crop yields it is often a hard race with starvation before the first cutting of barley in the spring. Since wheat is considered the best food and necessary for periods of hard work, it is fortunate that in these seasonal dietaries wheat is harvested at the time when there is the most work to be done.

Since fuel is an extremely expensive item in the preparation of food, its high cost may result in insufficiently cooked food. This has been especially noted in rice districts, where the day's supply of rice is cooked all at one time rather than for each meal separately. The purpose of this method is to save fuel and to save time. The time element in Chinese cooking is very considerable because the burning of grass, straw, or stalks, takes almost constant stoking of the fire. Hence the success of any new food introduced depends partly on how quickly it can be cooked; for example, there is objection to the Western beet as a food because of the length of time and amount of fuel it takes in cooking. In Yenshan Hsien, Chihli, fuel is so expensive and scarce that farmers cannot afford to heat water even for tea.

A few sample dietaries will visualize more clearly the diet of the farmers. Several of these are from regions other than those included in this discussion on diet.

Dietaries for Kiangning Hsien, (S), Kiangsu[1]

Ordinary times: Breakfast—Rice congee made from previous day's cooked rice, mustard leaves, dried winter radish chips, salted vegetables; *dinner*—rice, cabbage soup; *supper.*—rice congee or reheated rice, salted vegetables or left-over vegetables from noon.

[1] These dietaries are for farm households which are more well-to-do than the average because members of the family are also engaged in business in other places.

Busy times: Early morning—Glutinous rice congee with jujubes and sugar; *breakfast*—rice congee and salted vegetable; *dinner*—rice and green vegetables; *supper*—rice with vegetables, meat, and wine (the meats are chicken, fish, pork, or duck); *evening*—reheated rice, vegetables.

Notes:—A resident reported that the average farm family annually consumes two to four geese, one to two ducks, two to five chickens and 10-30 catties of fish. These are all salted. Between 40 and 100 pieces of salted bean curd are annually consumed in addition to an average of ten Chinese ounces of fresh bean curd per day. Vinegar from rice (several pounds) and sauce is usually made at home. Oils, salt, and 60 per cent of the vegetables are purchased. The annual consumption of salted cabbage varies from 200-500 catties and is eaten the year around. Mustard leaves are consumed at an annual rate of 70-200 catties per family.

It is seen from these notes that these farmers are much better off than those in many other regions.

Dietaries for Lienkiang Hsien, Fukien

Ordinary times: Breakfast—Rice congee and salted vegetables; *dinner*—rice and vegetables soup; *supper*—rice congee or reheated rice.

Notes:—Rice and sweet potatoes are the chief food. The sweet potatoes are cut into small pieces, dried, and stored in this condition. The potato chips are cooked with the rice and most farmers feel that it is a good combination. Vegetables are quite plentiful. One kind, belonging to the cabbage family, has a high sugar content. Mustard leaves and salted winter radish are common. The average sized family consumes about one half a catty of pork per week and about 1000 catties of vegetables per year. The method of cooking rice is arranged to save time and fuel. The rice is boiled in the morning until half cooked, then some is taken out for congee for breakfast. At dinner time the half cooked rice is steamed.

Dietaries for Sincheng Hsien, Honan

Autumn, winter, and spring (two meals only): Morning meal—(a) Soup made of millet congee (60 per cent), corn (20 per cent), kaoliang (20 per cent); (b) bread made from mixed flour of kaoliang, black soybeans and buckwheat (50 per cent), yellow soybeans and kaoliang (30 per cent), and black soybeans and kaoliang (10 per cent); (c) vegetables: red and white winter radish during the winter, sweet potato leaves during August and September, dried rape leaves throughout the year. Sweet potato leaves are eaten only by the poor farmers but the rape leaves are very good to eat. They are washed and then cooked with oil. The leaves of the wild plant of *Taraxacum officinalis* Weber (蒲公英) and *Capsella bursapastoris* Moench (薺菜) are eaten a great deal; *dinner*—Macaroni (麵條子) made from buckwheat, soybean (black and yellow) and kaoliang flour, millet with jujubes, sweet potatoes (steamed).

Summer (for a period after wheat harvest): Breakfast and supper—Wheat meal congee (whole wheat), bread or thin cakes of wheat flour (煎餅); *dinner*—wheat flour macaroni in soup or dry bread or thin cakes of wheat flour, vegetables such as onions, spinach, eggplant, peppers, cucumbers, gourds, mustard, and leeks;

Dietaries for Wusiang Hsien, Shansi

Breakfast—millet flour dough made into round cakes and boiled with millet congee, mustard and radish leaves:—

Winter: Dinner—(1) Millet, squash, and white potato boiled together and to which is added kaoliang and yellow soybean macaroni, salt, vinegar, raw onions and garlic; (2) Glutinous and hard millet, squash and white potatoes boiled together. The farmers call this "sweet food." Green

vegetables, salt vegetables, and raw dried winter radish chips; (3) "Stew" which consists of squash, white potato, small bean, wheat and millet mixed, flour macaroni. The farmers consider this as their best dish.

Note:—In the spring dried squash and another kind of melon (北瓜) appear in the noon diet. In late spring more macaroni is added to the "stew" and a wild "bitter, bitter" plant (苦苦菜) is eaten in large quantities. During the summer steamed millet and solid macaroni is eaten. In July and August boiled squash, green corn in ear, and string beans cooked with oil, water, and macaroni until the water is cooked off, are frequent articles of diet. The latter is considered especially good.

Supper—Vegetables, millet, squash, and beans boiled together to which some macaroni is added.

In summary this study shows that the food energy may be quite adequate or that it may, in some regions, amount to only a subsistence quantity. Such energy is obtained largely from cereals, the cheapest source of food in any country, but in most localities this is not carefully supplemented with other food products essential for good health.

The use of more sprouted beans would supply vitamin C, and, to a limited extent, vitamin A. Vitamin A could best be obtained from the greater use of such vegetables as carrots, spinach, and other green vegetables, and from sweet potatoes. The greater use of whole grain and soybeans would supply the needed iron and phosphorus, while carrots, green leaved vegetables and soybeans would insure sufficient calcium. In other words, it is evident that the farmer should be producing more fruits, roots, and vegetables. From a farm management standpoint this is also desirable, since it would intensify and diversify farming, thus utilizing more free time and distributing it to better advantage throughout the year. A good home garden would improve health conditions and would provide profitable additional labor for the farmer.

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CHAPTER XI

STANDARD OF LIVING

A study of farm organization in order to find the factors determining success or failure in farming is of course the primary aim of farm management investigation; nevertheless the exact nature of the business is not easily understood until one knows the quality of living it nets the farm family. In connection with any farm management study it is desirable, therefore, to have an accompanying study of the standard of living made possible by the farm business.

A limited amount of such information has been obtained in this study and includes data upon costs of different items of cash expenditures, values of products from the farm consumed by the family, a classification by different groups of expenditure items, and a qualitative study of nutrition as shown in the kind and amounts of food consumed. The study reveals the cost of living and in part the standard of living. Distinction must be made between the two because usually a low or high cost of living does not necessarily reflect a correspondingly low or high standard of living. Cost of living indicates simply the amount of money used, while standard of living reflects the human values obtained from a given amount of money expended.

TABLE 1. NUMBER OF HOUSEHOLDS, NUMBER OF PERSONS, AND NUMBER OF ADULT-MALE UNITS PER HOUSEHOLD FOR NORTH AND EAST CENTRAL CHINA

2370 farm households, 13 localities, six provinces, China (1922-1925)

Regions	Number of households	Persons per household	Persons per family	Adult-male units	
				Per household	Per family
North China	1389	6.03	5.78	4.63	4.37
East Central China ..	981	5.79	5.53	4.44	4.25
Both regions	*2370*	*5.94*	*5.70*	*4.56*	*4.32*

Of the total 2866 farm families, expenditures were reported for 2370 households in thirteen localities of the seven provinces. The size of the household averages 5.94 persons or 4.56 adult-male units. The family, usually of the "large family" type, averages 5.70 persons (table 1). Investigators found greater difficulty in obtaining information on household expenditures than they did for items pertaining to the farm business, and in fact, actual omissions occur not only for certain items not in the original schedule but for items included in the schedule for which, for one reason or another, there were no expenditures reported.[1]

This difficulty in finding what actual expenditures are is due to several causes. For instance, farmers naturally do not care to reveal what they have spent for gambling or local cult practices and the like. Moreover, in general, it is not always easy to give accurate reports of household expenditures because of the smallness of such transactions.

Again, in the comparison between localities, variation in values for various items may come from differences in local customs or in crop production, caused by climatic conditions. Prices per unit may vary with production, with nearness to markets, and with price levels in different parts of the country. In spite of these difficulties, however, the data appear to be of sufficient worth to warrant their inclusion and interpretation.

Items for which information was obtained are shown under operator's household expenses in the sample schedule (appendix IV). Non-cash expenditures are obtained from other parts

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[1]The inclusion of items pertaining to expenditures increased the difficulty of obtaining information because of the large number of queries, and investigators were advised to pay first attention to the record of a year's farm business. For this reason there are no reports from some localities and even from those reported upon results are not entirely satisfactory. The tables should be carefully studied if one desires to ascertain just what omissions have been made. In some localities certain items were reported while in others they were not. Items such as savings in the form of stores of grain or in cash hoards were not called for in the schedules. Since it is quite usual for farmers to hold over some grain for consumption in the following year for fear of bad crops, it is not surprising to find that in four localities the family earnings (table 41, chapter III) exceed reported expenditures by one-third and in three localities by one-fourth. With the exception of Kiangning Hsien (S), Kiangsu, and Sincheng Hsien, Honan, these localities had unusually good crop years (table 14, chapter VI), which would account to some extent for the difference. At Yenshan Hsien (1922) Chihli, expenditures exceeded family earnings by one-fourth, partly because of the bad crop year. The other localities show a close approximation of expenditures and family earnings.

of the schedule which indicate the quantity of products from the farm used by the household. Information was given by the head of the family, who was in most cases the operator himself. It is he who does most of the buying of family supplies rather than the homemaker. Food, rent, and fuel expenditures are for the household while the other items are for the family.

The average value per family of expenditures by different classes of goods for families having such expenditures and the percentage of families having these same expenditures are given in tables 8-17.

CLASSIFICATION OF GOODS USED

Individual items have been classified under food, clothing, fuel and light, rent, advancement, furnishings, maintenance of health, personal, and unclassified.

Clothing includes both raw material, such as cotton and cotton yarn, and ready-made clothing, as well as cloth used in making clothing at home.

The term advancement includes items of education, religion, recreation, charity, social obligations, and New Year holidays. While some of these may appear to be of little benefit to the individual, still in most cases the expenditures are considered of value.[1]

Personal includes tea, tobacco, pipes, opium, liquor and wines, gambling, debts, barber and hair dresser, gifts, toilet articles, and jewelry. The item of unclassified includes funerals, weddings, servants, and lawsuits.

VALUE BY CLASSES OF GOODS CONSUMED

The distribution of the value of goods consumed according to the uses of food, fuel, clothing, rent, maintenance of health, advancement, personal goods, furnishings, and unclassified, is shown in table 2. The proportionate value of such goods reveals, in part, the standard of living (table 3, figs. 1 and 2) and such a standard can best be measured by a comparison of living costs with other farm population groups in a number of countries (figs. 3 and 4).

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[1]The term "advancement" is thus used by E. L. Kirkpatrick of the Bureau of Agricultural Economics, Washington, D. C. and has been adopted here for want of a better one and for comparative purposes.

TABLE 2. COMBINED VALUE BY GROUPS OF GOODS ANNUALLY CONSUMED PER FARM HOUSEHOLD FURNISHED BY THE FARM AND PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Food	Rent	Clothing	Fuel and light	Maintenance of health	Advancement	Personal	Furnishings	Unclassified	Total of all items	Annual value per adult-male unit: Family basis	Annual value per adult-male unit: Household basis
North China												
Anhwei												
Hwaiyuan	$107.17	$ 6.70	$16.41	$19.27	$ 3.77	-$16.09	$ 6.43	$ 2.63	$ 6.69	$185.16	$46.88	$42.27
Su	153.48	4.35	21.68	22.93	3.03	28.27	10.47	2.13	12.92	259.26	50.24	45.64
Chihli												
Pingsiang	58.83	9.24	4.03	11.63	0.05	2.88	.86	1.10	...	88.62	26.14	24.82
Yenshan (1922)	62.20	9.24	6.68	20.52	.40	10.34	3.40	...	0.35	113.13	27.86	27.66
Yenshan (1923)	88.02	8.59	7.23	26.63	.72	9.21	6.79	2.49	5.52	155.20	39.90	37.95
Honan												
Sincheng	194.31	8.40	6.07	28.42	1.20	11.65	3.39	1.16	4.05	258.65	48.26	46.69
Kaifeng	268.16	12.99	24.66	20.44	1.10	8.32	6.06	4.62	3.32	349.67	60.92	58.67
Shansi												
Wusiang	57.64	6.59	11.09	18.35	.97	15.54	5.16	...	...	115.34	33.63	31.01
Average by localities	*123.73*	*8.26*	*12.23*	*21.02*	*1.40*	*12.79*	*5.33*	*1.77*	*4.10*	*190.63*	*41.73*	*39.34*
East Central China												
Anhwei												
Laian (1922)	108.58	13.56	18.36	43.72	1.23	24.92	12.00	.69	...	223.06	49.68	47.56
Fukien												
Lienkiang	178.27	17.57	43.07	27.64	5.58	28.58	35.98	...	...	336.69	85.24	84.38
Kiangsu												
Kiangning (S)	179.56	24.80	37.10	26.81	...	54.59	15.94	...	...	338.80	79.34	72.09
Kiangning (T)	123.55	5.85	21.88	37.34	2.50	34.55	15.74	4.48	5.44	251.33	52.47	51.50
Wuchin	191.99	19.23	6.78	25.43	3.52	22.96	11.19	1.89	10.27	293.26	78.62	74.43
Average by localities	*156.39*	*16.20*	*25.44*	*32.19*	*2.57*	*33.12*	*18.17*	*1.41*	*3.14*	*288.63*	*69.07*	*65.99*
Average by 13 localities	*136.29*	*11.32*	*17.31*	*25.32*	*1.85*	*20.61*	*10.26*	*1.63*	*3.73*	*228.32*	*52.24*	*49.59*

TABLE 3. PERCENTAGE DISTRIBUTION OF EXPENDITURE PER FARM HOUSEHOLD FOR DIFFERENT GROUPS OF ITEMS FURNISHED BY THE FARM AND PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Percentage expenditure for specified items									
	Food	Rent	Cloth-ing	Fuel and light	Main-tenance of health	Adv-ance-ment	Per-sonal	Furni-shings	Uncla-ssified	Total
North China										
Anhwei										
Hwaiyuan	57.9	3.6	8.9	10.4	2.0	8.7	3.5	1.4	3.6	100
Su	59.2	1.7	8.4	8.8	1.2	10.9	4.0	0.8	5.0	100
Chihli										
Pingsiang	66.4	10.4	4.5	13.1	0.1	3.3	1.0	1.2	...	100
Yenshan (1922)	55.0	8.2	5.9	18.1	0.4	9.1	3.0	...	0.3	100
Yenshan (1923)	56.7	5.5	4.7	17.1	0.5	5.9	4.4	1.6	3.6	100
Honan										
Sincheng	75.1	3.3	2.3	11.0	0.5	4.5	1.3	0.4	1.6	100
Kaifeng	76.7	3.7	7.0	5.9	0.3	2.4	1.7	1.3	1.0	100
Shansi										
Wusiang	50.0	5.7	9.6	15.9	0.8	13.5	4.5	...	...	100
Average by localities	*62.1*	*5.3*	*6.4*	*12.6*	*0.7*	*7.3*	*2.9*	*0.8*	*1.9*	*100*
East Central China										
Anhwei										
Laian (1922)	48.7	6.1	8.2	19.6	0.5	11.2	5.4	0.3	...	100
Fukien										
Lienkiang	52.9	5.2	12.8	8.2	1.7	8.5	10.7	...	...	100
Kiangsu										
Kiangning (S)	53.0	7.3	11.0	7.9	...	16.1	4.7	...	...	100
Kiangning (T)	49.2	2.3	8.7	14.8	1.0	13.7	6.3	1.8	2.2	100
Wuchin	65.5	6.6	2.3	8.7	1.2	7.8	3.8	0.6	3.5	100
Average by localities	*53.3*	*5.5*	*8.6*	*11.3*	*0.9*	*11.5*	*6.2*	*0.5*	*1.2*	*100*
Average by 13 localities	*58.9*	*5.3*	*7.3*	*12.3*	*0.8*	*8.9*	*4.2*	*0.7*	*1.6*	*100*

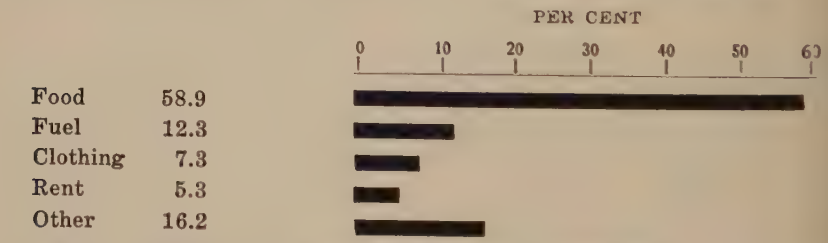

Fig. 1.—Proportion by groups of all goods consumed.
2370 farm households, 13 localities, six provinces, China (1922-1925).

The total value of all goods consumed by all households was $228.32 per household. The range is from $88.62 per household for Pingsiang Hsien, Chihli, to $349.67 for Kaifeng Hsien, Honan. Expenditure for the hsiens of Yenshan

and Pingsiang, Chihli, and of Wusiang, Shansi, are small in amount chiefly because the family earnings (table 41, chapter III) are also less than for the other localities. Although the farmers included in the study at Yenshan Hsien (1923), Chihli, suffered from a severe drought that affected the wheat crop, still they consumed goods of greater value than did the farmers seven miles away who were included in the Yenshan (1922) study. Advance in price levels and more complete information account for this situation.

Values per adult-male unit of all goods consumed show an average expenditure of $50.07 divided by classes as follows: food, $22.94; fuel, $4.26; clothing, $3.04; rent, $1.91; all other expenditures, $6.68 (table 4).

On a per capita basis the average value of all goods consumed is $38.44 per year, a startlingly low figure upon which to maintain existence (table 5).

TABLE 4. VALUE PER ADULT-MALE UNIT* OF ALL GOODS CONSUMED; FOOD, RENT, FUEL AND LIGHT, CLOTHING, AND ALL OTHER GOODS

2370 farm households, 13 localities, six provinces, China (1922-1925)

Regions	All goods	Food	Fuel and light	Clothing	Rent	Other
North China	$41.17	$20.52	$ 3.49	$ 2.12	$ 1.37	$ 4.39
East Central China	65.01	27.01	5.56	4.55	2.80	10.45
Both regions	*50.07*	*22.94*	*4.26*	*3.04*	*1.91*	*6.68*

*Food, fuel and rent are calculated on a household basis, while clothing and other goods are calculated on a family basis. For this reason the totals in this table and table 5 are not quite the same as those in table 2.

TABLE 5. VALUE OF ALL GOODS CONSUMED PER HOUSEHOLD, PER ADULT-MALE UNIT, AND PER PERSON FOR ALL FAMILIES

2370 farm households, 13 localities, six provinces, China (1922-1925)

Regions	Per household	Per person	Per adult-male unit
North China	$190.63	$ 31.61	$ 41.17
East Central China	288.63	49.85	65.01
Both regions	*228.32*	*38.44*	*50.07*

The average value per household for all households of the four different physical necessities is $136.29 for food, $25.32 for fuel and light, $17.31 for clothing, and $11.32 for rent. All other goods amounted to $38.08 per household. The proportionate value of these four items to the total value of all goods consumed is 83.8 per cent; in North China it is 86.4 per cent, and in East Central China it is 79.7 per cent. It is obvious that the lower the percentage for necessities, the higher the standard of living, because more may be expended upon the things, other than necessities, which make life worth living.

Comparing the regions in North China with those in East Central China the value of goods consumed in the latter is 51.4 per cent greater than for the former. Casual observers often say the farmers of East Central China have a higher standard of living than those in North China and, judging from the amount of money spent, this seems to be true.

Before accepting such conclusions, however, one must first be certain that other factors do not affect them. Differences in the kind of food eaten and hence in its value might be one cause of variation. Food equally nutritious and equally palatable in North China, if cheaper, would help to account for the differences these data show. On the other hand, if the food is not so nutritious or so palatable the difference may be very real and may result in higher standard of living in East Central China. In making any comparison it is necessary to determine the variations in amount and quality of goods consumed as well as in possible differences in the price levels of the same goods in two or more localities. Unfortunately the present study does not indicate the difference in the quality and quantity of goods consumed in the two sections. It appears, however, that farmers of East Central China do have more goods than those in North China. Whether this actually contributes to a higher standard requires further investigation.

Perhaps the best way to judge a possible difference in standard of living between North and East Central China is by the differing proportions of goods classified by groups (fig. 2). East Central China spends less for food but more for clothing and for purposes other than the four necessities.

An interesting way in which to study these two groups, the farmers of North China and East Central China, is in those sections south of the Yangtze River of which the hsiens of

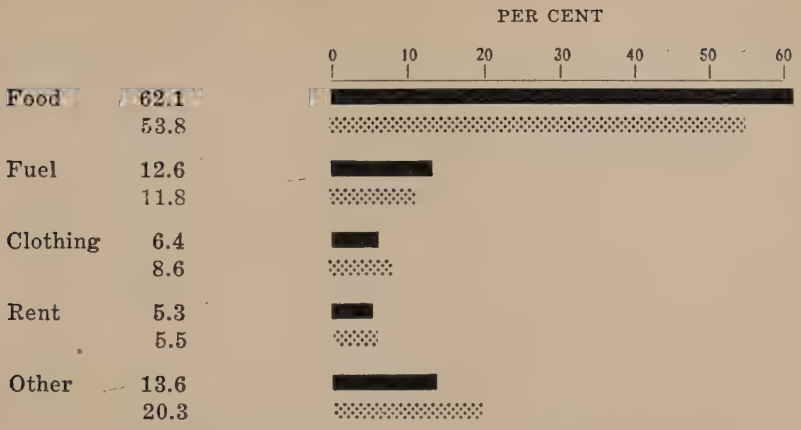

Fig. 2.—Proportion by groups of all goods consumed in North and East Central China

2370 farm households, 13 localities, six provinces, China (1922-1925).

Kiangning and Wuchin, Kiangsu, are a part. Northern farmers have emigrated to this region and settled there, and the two groups live side by side, each maintaining its own habits. The northern farmers work harder and live on less than the native farmers and hence are gradually displacing the latter. Their houses are cheaper, having mud walls and thatched roofs rather than the brick and tile of the region. Socially the two groups do not mix, the native farmer considering himself above the other. Intermarriage does not take place frequently, and to all intents and purposes a situation appears which has almost the same difficulties inherent in the assimilation of one race by another.

To what extent one may thus compare the two standards, however, is a question. These northerners may come from the lower strata of farm population and the very fact that they have immigrated may be an indication of this, since it is usually years of crop failures that force the inefficient poor to leave their native regions. Careful study must be made before such a conclusion can be accepted. These farmers are also largely from the provinces just north of the Yangtze River and hence cannot represent all North China.

The expenditure of $228.32 per farm household of 5.94 persons in China may be compared with that of Gold $1,598.00 for goods consumed per farm household of 4.8 persons in the

United States of America (1922-24), (1), (fig. 3); with Yen 1,253 per household in Japan (1925), (2), and with Danish crowns 5,314 per farm household in Denmark (1925-26), (3). In equivalent Chinese currency these amounts are $2,988, $958 and $2,391 respectively. The ratio between China and United States on an equivalent currency and per capita basis is 1 to 16.6.

This great difference does not necessarily mean that there is an equal divergence of standards of living. While there is a wide gap between the two standards, it is partly because the Chinese farmer obtains his food largely from seeds and tuber crops, a much cheaper source than that of the animal products which make up a significant part of the cost of dietaries of farmers in the United States. Price level is another factor which must be considered in this comparison since the quantity of goods a given amount of money will buy in China may not be the same as in other countries.

A comparison of percentages of value of goods available for purposes other than the necessities of food, fuel and light, clothing, and rent for a number of countries indicates that farm households in China have less for other purposes than do some countries (fig. 4). For farm families in the United States (1) the percentage expended on necessities is 73.7, while in

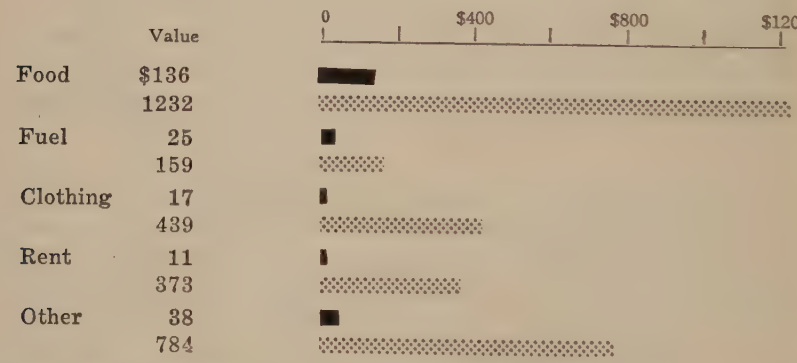

Fig. 3.—Comparison between China and the United States of value (Chinese silver currency) of goods consumed by farm households.*

2370 farm households, six provinces, China ▬ (1922-1924).

2886 farm families, eleven states, U.S.A. ▒ (1922-1924).

*Conversion of gold into silver is based on the average exchange rate of the Shanghai Commercial and Savings Bank for the years 1922-1925, which is $1.87 for each gold dollar.

Japan (2) it is only 60.9. The proportion for other purposes for Japan is somewhat misleading because land taxes have been included whereas for other countries they have not been considered as household expenditures. They amount to 2.9 per cent of all expenditures.

Without question, however, after taking all into consideration, the standard of living for farm families in China is below that of the countries mentioned and is too low for even a minimum standard.

SOURCE OF GOODS CONSUMED

The farm furnished 65.9 per cent of the total value of goods consumed by all households (tables 6 and 7 and fig. 5). In North China the farm supplied 73.3 per cent, while in East Central China it furnished 58.1 per cent. This is indicative of the greater commercialization of agriculture in East Central China where the large city population of the nation is centered. In the United States, however, there is far greater commercialization as is shown by the fact that only 42.8 per cent of the total goods consumed is supplied by the farm (1). For all farm households included in this study the farm directly supplied the household with 83.2 per cent of all the food and 18.3 per cent of the clothing (in the form of raw materials). In North China 88.5 per cent of the food is furnished by the farm while in East Central China the percentage is 76.5. In comparison, farm

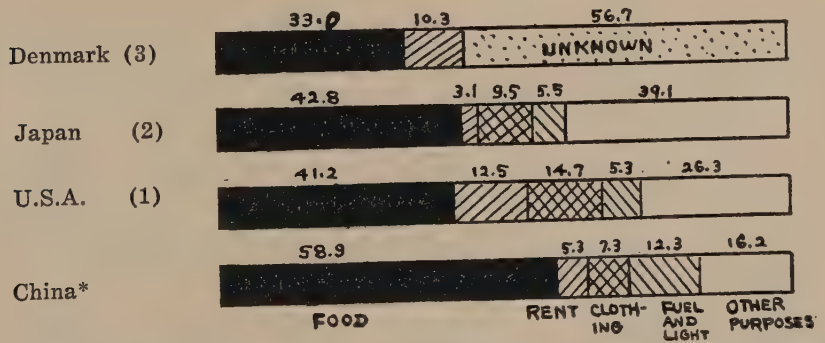

Fig. 4.—A comparison by countries of distribution of total goods consumed among the items of food, rent, clothing, fuel and light and for all other purposes.

*From data representing 2370 farm households in 13 localities of six provinces (1922-1925).

TABLE 6. AMOUNT OF EXPENDITURE PER FARM HOUSEHOLD FOR DIFFERENT GROUPS OF ITEMS FURNISHED BY THE FARM OR PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Food		Rent	Clothing		Fuel and light		Maintenance of health	Advancement	Personal		Furnishings		Unclassified		Total of all items	
	From farm	Purchased	From farm	From farm	Purchased	From farm	Purchased	Purchased	Purchased	From farm	Purchased	From farm	Purchased	From farm	Purchased	From farm	Purchased
North China																	
Anhwei																	
Hwaiyuan	$90.99	$16.18	$6.70	$8.65	$7.76	$18.10	$1.17	$3.77	$16.09	$0.15	$6.28	...	$2.63	...	$6.69	$124.59	$60.57
Su	126.46	27.02	4.35	5.90	15.78	18.46	4.47	3.03	28.27	0.15	10.32	...	2.13	...	12.92	155.32	103.94
Chihli																	
Pingsiang	48.60	10.23	9.24	1.19	2.84	11.24	0.39	0.05	2.88	...	0.86	...	1.10	...	...	70.27	18.35
Yenshan (1922)	48.74	13.46	9.24	...	6.68	20.52	...	0.40	10.34	...	3.40	...	...	0.35	...	78.85	34.28
Yenshan (1923)	70.74	17.28	8.59	0.27	6.96	21.41	5.22	0.72	9.21	0.04	6.75	...	2.49	...	5.52	101.05	54.15
Honan																	
Sincheng	178.61	15.70	8.40	...	6.07	13.34	15.08	1.20	11.65	0.02	3.37	...	1.16	...	4.05	200.37	58.28
Kaifeng	254.45	13.71	12.99	22.16	2.50	14.60	5.84	1.10	8.32	...	6.06	...	4.62	...	3.32	304.20	45.47
Shansi																	
Wusiang	57.53	0.11	6.59	0.61	10.48	18.35	...	0.97	15.54	...	5.16	1.04	...	...	...	4.12	32.26
Average by localities	*109.52*	*14.21*	*8.26*	*4.85*	*7.38*	*17.00*	*4.02*	*1.41*	*12.99*	*0.05*	*5.28*	*0.13*	*1.77*	*0.04*	*4.06*	*139.35*	*51.12*
East Central China																	
Anhwei																	
Laian (1922)	104.74	3.84	13.56	2.02	16.34	43.72	...	1.23	24.92	...	12.00	0.69	...	...	...	164.73	58.33
Fukien																	
Lienkiang	155.33	22.94	17.57	0.06	43.01	27.64	...	5.58	28.58	...	35.98	...	...	...	...	200.60	136.09
Kiangsu																	
Kiangning (S)	105.02	74.54	24.80	0.07	37.03	26.81	...	...	54.59	...	15.94	...	...	...	...	156.70	182.10
Kiangning (T)	65.18	58.37	5.85	...	21.88	34.63	2.71	2.50	34.55	0.02	15.72	0.07	4.41	...	5.44	105.75	145.58
Wuchin	168.37	23.62	19.23	0.18	6.60	23.01	2 42	3.52	22.96	...	11.19	0.23	1.66	...	10.27	211.02	82.24
Average by localities	*119.73*	*36.66*	*16.20*	*0.47*	*24.97*	*31.16*	*1.03*	*2.57*	*33.12*	—	*18.17*	*0.20*	*1.21*	...	*3.14*	*167.76*	*120.87*
Average by 13 localities	*113.44*	*22.58*	*11.31*	*3.16*	*14.15*	*22.45*	*2.87*	*1.85*	*20.61*	*0.03*	*10.23*	*0.16*	*1.55*	*0.03*	*3.71*	*150.58*	*77.32*

TABLE 7. PERCENTAGE DISTRIBUTION BY GROUPS OF VALUE OF GOODS CONSUMED PER FARM HOUSEHOLD FURNISHED BY THE FARM AND PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Food		Rent	Clothing		Fuel and light		Maintenance of health	Advancement	Personal		Furnishings		Unclassified		Per cent of all items	
	From farm	Purchased	From farm	From farm	Purchased	From farm	Purchased	Purchased	Purchased	From farm	Purchased	From farm	Purchased	From farm	Purchased	From farm	Purchased
North China																	
Anhwei																	
Hwaiyuan	84.9	15.1	100	52.7	47.3	93.9	6.1	100	100	2.3	97.7	...	100	...	100	67.3	32.7
Su	82.4	17.6	100	27.2	72.8	80.5	19.5	100	100	1.4	98.6	...	100	...	100	59.9	40.1
Chihli																	
Pingsiang	82.6	17.4	100	29.5	70.5	96.6	3.4	100	100	...	100.0	...	100	...	...	79.3	20.7
Yenshan (1922)	78.4	21.6	100	...	100.0	100.0	...	100	100	...	100.0	...	...	100	...	69.7	30.3
Yenshan (1923)	80.4	19.6	100	3.7	96.3	80.4	19.6	100	100	0.6	99.4	...	100	...	100	65.1	34.9
Honan																	
Sincheng	91.9	8.1	100	...	100.0	46.9	43.1	100	100	0.6	99.4	...	100	...	100	77.5	22.5
Kaifeng	94.9	5.1	100	89.9	10.1	71.4	28.6	100	100	...	100.0	...	100	...	100	87.0	13.0
Shansi																	
Wusiang	99.8	0.2	100	5.5	94.5	100.0	...	100	100	...	100.0	...	...	....	...	72.0	28.0
*Average**	*83.5*	*11.5*	*100*	*39.7*	*60.3*	*80.9*	*19.1*	*100*	*100*	*0.9*	*99.1*	...	*100*	*1.0*	*99.0*	*73.3*	*26.7*
East Central China																	
Anhwei																	
Laian (1922)	96.5	3.5	100	11.0	89.0	100.0	...	100	100	...	100.0	100	...	...	...	73.8	26.2
Fukien																	
Lienkiang	87.1	12.9	100	0.1	99.9	100.0	...	100	100	...	100.0	...	...	...	...	59.6	40.4
Kiangsu																	
Kiangning (S)	58.5	41.5	100	0.2	99.8	100.0	...	...	100	...	100.0	...	...	...	...	46.2	53.8
Kiangning (T)	52.8	47.2	100	...	100.0	92.7	7.3	100	100	0.1	99.9	1.6	98.4	...	100.0	42.1	57.9
Wuchin	87.7	12.3	100	2.7	97.3	90.5	9.5	100	100	...	100.0	12.2	87.8	...	100.0	72.0	28.0
*Average**	*76.5*	*23.5*	*100*	*1.9*	*98.1*	*96.8*	*3.2*	*100*	*100*	...	*100.0*	*14.2*	*85.8*	...	*100.0*	*58.1*	*41.9*
*Average, 13 localities**	*83.2*	*16.8*	*100*	*18.3*	*81.7*	*88.7*	*11.3*	*100*	*100*	*0.3*	*99.7*	*4.9*	*95.1*	*0.8*	*99.2*	*65.9*	*34.1*

*These percentages are computed from the average amounts in table 6.

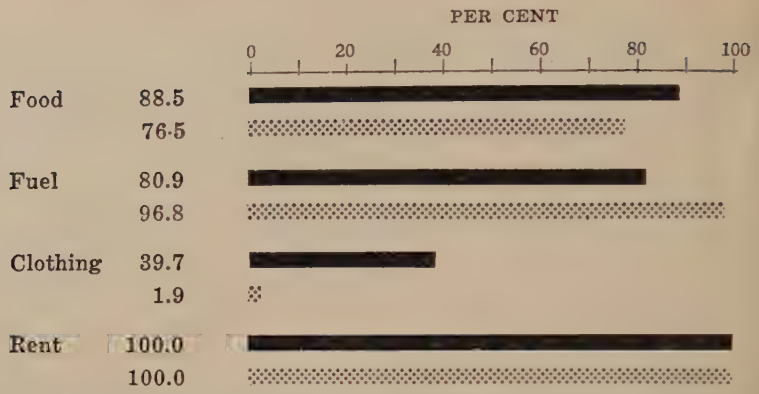

Fig. 5.—Proportion of goods supplied by the farm to total value of goods consumed in North ▬ and East Central China ▒

2370 farm households, 13 localities, six provinces, China (1922-1924).

families in the United States consume 66.9 per cent of their food from that directly furnished by the farm—a difference not so great as one might expect (1). Of clothing the farm supplied 39.7 per cent in North China and 1.9 per cent in East Central China.

For fuel the farm furnished 88.7 per cent for all regions; 80.9 per cent in North China, and 96.8 per cent in East Central China. The smaller proportion for North China is caused by the burning of more coal and the absence of fuel producing hills, mountains, or marsh land.

In China shelter is mostly supplied by the farm; in North China the house floors are chiefly of earth, the walls largely of tamped earth or earth bricks, and the roof of thatched straw or thatching grass produced on the farm. In East Central China brick walls and tile roofs are commonly used. The lumber used for posts, rafters, and braces is probably about equally obtained from the farm or purchased from other places. Since the farmer's house is usually associated with the farm land, rent is considered as supplied by the farm. It is only for food and shelter that the farm households studied may be said to approach self-sufficiency and even for food almost seventeen per cent comes from outside sources. The North China households are more nearly self-sufficing than those of East Central China, which are located nearer the large city populations.

PHYSICAL NECESSITIES

Food

The value of the food consumed, either furnished by the farm or purchased, is $22.94 per adult-male unit per year (table 4). Figured on a monthly basis, farmers are living on $1.91 per adult person per month for food alone. This to many will seem an incredibly low amount. It is only possible because of the predominance of grains in the diet and because farmers use the cheapest kinds even of these, as, for instance, kaoliang rather than wheat. East Central China farmers eat food to the value of 31.6 per cent greater than the North China farmers.

Food constitutes for all households nearly three-fifths the value of all goods consumed (fig. 1). For North China it is somewhat greater than this and for East Central China it is less because the latter have larger earnings and therefore have more to spend on things other than food (fig. 2). The highest proportion spent for food is 76.7 per cent at Kaifeng Hsien, Honan, while the lowest is 48.7 per cent for Laian Hsien (1922) Anhwei. The farmers in Kaifeng Hsien ate large quantities of food because of the good crop year.

Comparing these proportions for food in China with those in other countries, it is evident that other countries have lower proportions for food than does China, notably Denmark, where it amounts to only one-third of the total expenditures (fig. 4). This is significant in that it indicates generally lower standards of living in China than in these other countries. This difference exists not only between the countries, but also between North and East Central China.

Clothing

Clothing constitutes for all families 7.3 per cent of the value of all goods consumed; in North China it is a little less, 6.4 per cent, and in East Central China it is more, 8.6 per cent (tables 8, 9, 10, 11, and figs. 1 and 2). The highest expenditure for clothing is $43.07 in Lienkiang, Fukien, and the lowest $4.03 in Pingsiang, Chihli. The average value of clothing per family is $17.31 for all families and is twice as much for East Central China as for North China. Usually families having a higher

TABLE 8. AMOUNT OF EXPENDITURES FOR FOOD, CLOTHING, RENT AND FURNISHINGS PER FARM HOUSEHOLD HAVING SUCH ITEMS FURNISHED BY THE FARM OR PURCHASED†

2370 farm households, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm					Purchased				
		Clothing (raw material)*					Clothing			
	Food	Cotton	Other	Rent	Furnishings	Food	Raw material	Cotton	Ready-made clothing	Furnishings
North China										
Anhwei										
Hwaiyuan	$90.99	$6.46	$5.07	$6.75	$...	$16.18	$9.23	$...	$2.00	$3.10
Su	126.46	7.95	5.04	4.41	...	27.02	14.89	...	22.05	2.31
Chihli										
Pingsiang	48.60	...	4.04	10.03	...	10.23	2.84	...	...	1.10
Yenshan (1922)	48.74	...	...	9.43	...	13.81	6.77	...	...	...
Yenshan (1923)	70.74	...	1.90	9.36	...	17.28	7.42	...	2.70	3.04
Honan										
Sincheng	178.61	...	...	8.71	...	15.80	2.99	4.13	8.33	1.21
Kaifeng	254.45	15.18	14.28	12.99	...	13.71	2.55	...	10.17	4.69
Shansi										
Wusiang	57.53	10.90	9.44	6.59	...	2.45	11.19	...	...	...
Weighted average	*107.73*	*10.09*	*7.22*	*7.99*	...	*17.43*	*8.47*	*4.13*	*16.69*	*2.50*
East Central China										
Anhwei										
Laian (1922)	104.74	11.38	12.50	13.56	11.50	22.56	...	...	17.02	...
Fukien										
Lienkiang	155.33	...	3.03	17.57	...	26.78	369.00	...	53.34	...
Kiangsu										
Kiangning (S)	105.02	1.65	...	25.04	...	74.54	37.40	...	...	...
Kiangning (T)	65.18	...	...	6.10	2.97	58.37	20.28	...	6.00	4.44
Wuchin	168.37	...	2.82	19.68	3.32	23.62	7.31	...	5.50	1.69
Weighted average	*123.31*	*6.80*	*5.42*	*16.33*	*4.80*	*44.53*	*21.35*	...	*28.57*	*2.86*
Weighted average, 13 localities	*114.38*	*9.96*	*7.06*	*11.68*	*4.30*	*29.17*	*13.02*	*4.13*	*27.35*	*2.63*

*The average value of raw material for clothing supplied by the farm per household is $12.03 for all localities, $12.52 for North China and $6.32 for East Central China; for clothing purchased the average is $15.57 for all households, $8.88 for North China households and $25.42 for East Central China households.

†The averages for tables 8–17, only include farms for which the item occurred.

standard of living spend more proportionately for clothing and East Central China appears to have this higher standard for the item of clothing as well as for a number of other items. Farm families in the United States spend Gold $234.90, or 14.7 per cent of their budget, on clothes; most of the other countries (fig. 4) spend proportionately more on clothes than do the Chinese farmers included in this investigation. No detailed study was made of the kind, quality, warmth, and comfort of clothing. A little over one-fourth of the value of the clothing is produced on the farm and there made into garments. To what extent the fiber, mostly cotton, raised for

TABLE 9. PERCENTAGE OF FARM HOUSEHOLDS HAVING EXPENDITURES FOR FOOD, CLOTHING, RENT, AND FURNISHINGS FURNISHED BY THE FARM AND PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm					Purchased				
		Clothing (raw material) *					Clothing			
	Food	Cotton	Other	Rent	Furnishings	Food	Raw material	Cotton	Ready-made clothing	Furnishings
North China										
Anhwei										
Hwaiyuan	100.0	87.1	59.7	99.2	...	100.0	83.9	...	0.8	84.7
Su	100.0	57.7	26.2	98.6	...	100.0	95.1	...	7.3	92.0
Chihli										
Pingsiang	100.0	...	29.6	92.1	...	100.0	100.0	...	...	100.0
Yenshan (1922)	100.0	...	...	98.0	...	97.3	98.7	...	...	...
Yenshan (1923)	100.0	...	14.3	91.7	...	100.0	93.2	...	1.5	82.0
Honan										
Sincheng	100.0	...	...	96.5	...	99.3	54.2	99.3	4.2	95.8
Kaifeng	100.0	98.0	51.0	100.0	...	100.0	89.9	...	2.0	98.7
Shansi										
Wusiang	100.0	0.8	5.6	100.0	...	4.4	93.6	...	...	...
Weighted average	*100.0*	*30.3*	*21.8*	*97.4*	...	*82.4*	*89.8*	*10.3*	*2.4*	*65.8*
East Central China										
Anhwei										
Laian (1922)	100.0	9.0	8.0	100.0	6.0	17.0	...	...	96.0	...
Fukien										
Lienkiang	100.0	...	1.9	100.0	...	85.7	1.2	...	72.0	...
Kiangsu										
Kiangning (S)	100.0	3.9	...	99.0	...	100.0	99.0	...	...	...
Kiangning (T)	100.0	...	...	95.9	2.3	100.0	98.6	...	31.3	99.5
Wuchin	100.0	...	6.3	97.7	7.0	100.0	87.7	...	3.3	97.7
Weighted average	*100.0*	*1.7*	*3.1*	*98.2*	*3.3*	*89.2*	*69.3*	...	*29.6*	*51.9*
Weighted average, 13 localities	*100.0*	*18.5*	*14.1*	*97.7*	*1.4*	*85.2*	*81.3*	*6.0*	*13.6*	*60.0*

*The percentage of all households having clothing from raw material supplied by the farm is 23.5, for North China 37, and for East Central China 4.5 per cent; all households purchasing clothing amounted to 93.5 per cent, for North China 95 per cent and for East Central China 91.4 per cent.

this purpose is made into thread and woven into cloth is not known. Probably its use is confined largely to padding garments for winter and making a limited amount of cotton yarn.

The farm supplied more families with cotton than with any other clothing material and to a greater value than all the other materials combined.

Cotton clothing predominates above all other kinds, for the ordinary clothes of the farm families are made of heavy cotton cloth, usually blue in color. In summer the garments are unlined, and in winter padded thickly with layers of cotton. In some places such as Lienkiang Hsien, Fukien, clothing is almost entirely purchased, while in others, especially in North

TABLE 10. AMOUNT OF EXPENDITURES FOR FUEL AND LIGHT PER FARM HOUSEHOLD HAVING SUCH ITEMS FURNISHED BY THE FARM OR PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm					Purchased			
	Stalks and straw	Grass and bushes	Reeds	Tree branches	Fire wood	Coal	Fire wood	Grass and bushes	Oil (for light)
North China									
Anhwei									
Hwaiyuan	$10.92	$12.76	$...	$...	$...	$...	$...	$10.00	$1.10
Su	18.04	2.40	...	8.21	...	6.64	...	5.00	2.54
Chihli									
Pingsiang	11.25	...	...	2.93	...	...	...	1.54	0.34
Yenshan (1922)	9.20	13.65	...	...	...	...	...	...	...
Yenshan (1923)	17.51	11.64	...	6.50	...	...	...	7.65	1.65
Honan									
Sincheng	13.24	5.00	5.00	...	...	10.94	...	...	4.37
Kaifeng	15.00	...	...	...	...	7.75	7.36	...	3.02
Shansi									
Wusiang	...	17.59	...	...	2.94	...	...	...	...
Weighted average	*14.27*	*14.61*	*5.00*	*6.43*	*2.94*	*9.62*	*7.36*	*6.55*	*2.23*
East Central China									
Anhwei									
Laian (1922)	15.62	31.55	...	...	...	...	...	...	..
Fukien									
Lienkiang	17.43	15.52	...	...	...	...	...	...	...
Kiangsu									
Kiangning (S)	40.00	26.61	...	....	...	...	...	...	...
Kiangning (T)	21.59	11.79	...	2.31	2.37	...	...	6.45	2.38
Wuchin	22.07	3.45	...	4.00	...	...	...	...	2.42
Weighted average	*20.44*	*18.23*	...	*2.33*	*2.37*	...	...	*6.45*	*2.40*
Weighted average, 13 localities	*16.75*	*16.72*	*5.00*	*4.18*	*2.71*	*9.62*	*7.36*	*6.54*	*2.29*

China, it is almost entirely made by the farm women. Common observation is that women in North China do not work in the field as much as in East Central China and consequently have more time for making clothes. Bound feet are much more common in North China and may account largely for this difference. Shoes are usually of cloth and are in most places made at home by the housewife.

Fewer than one-third of the farm families in North China use cotton from the farm, while in East Central China the percentage is only 1.7. This lower percentage appears to be caused by a different type of farming where it is not the custom to grow cotton for family use in spite of what seem to be favorable soil and climatic conditions. The other materials supplied by the farm were cocoons, hemp and indigo at Hwaiyuan Hsien, Anhwei, cocoons and hemp at Su Hsien, Anhwei;

TABLE 11. PERCENTAGE OF FARM HOUSEHOLDS HAVING EXPENDITURES FOR FUEL AND LIGHT FURNISHED BY THE FARM OR PURCHASED

2370 farm households, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm					Purchased			
	Stalks and straw	Grass and bushes	Fire wood	Tree branches	Reeds	Oil (for light)	Coal	Grass and bushes	Fire wood
North China									
Anhwei									
Hwaiyuan	96.0	59.7	...	...	...	99.2	...	0.8	...
Su	99.0	10.8	...	4.2	...	98.6	21.7	10.5	...
Chihli									
Pingsiang	98.7	...	...	4.6	...	98.7	...	3.3	...
Yenshan (1922)	78.7	97.3	...	...	...	...	...	...	...
Yenshan (1923)	99.2	15.8	...	33.8	...	100.0	...	46.6	...
Honan									
Sincheng	100.0	1.4	...	...	0.7	96.5	99.3	...	...
Kaifeng	97.3	...	...	...	...	100.0	1.3	...	36.9
Shansi									
Wusiang	...	98.4	35.5	...	...	...	...	...	...
Weighted average	*78.5*	*37.5*	*6.4*	*4.6*	*0.1*	*70.3*	*14.9*	*7.1*	*4.0*
East Central China									
Anhwei									
Laian (1922)	86.0	96.0	...	...	...	...	...	...	...
Fukien									
Lienkiang	79.5	88.8	...	...	...	...	...	...	...
Kiangsu									
Kiangning (S)	1.5*	98.5*	...	...	...	...	...	...	...
Kiangning (T)	100.0	98.2	27.2	35.5	...	100.0	...	5.1	...
Wuchin	100.0	27.0	...	0.3	...	100.0	...	...	...
Weighted average	*74.8*	*74.7*	*6.0*	*8.0*	...	*52.7*	...	*1.1*	*2.3*
Weighted average, 13 localities	*77.0*	*52.9*	*6.2*	*6.0*	—	*63.0*	*8.7*	*4.6*	*2.3*

*With the exception of a few households stalks and straw have been included with grass and bushes and probably make up the major part of the latter.

hemp, at Pingsiang Hsien, Chihli; hemp and wool at Kaifeng Hsien, Honan; hemp at Laian Hsien, Anhwei; hemp and wool at Wusiang Hsien, Shansi; ramie, wool, and feathers at Lienkiang Hsien, Fukien; and silk and cocoons at Wuchin Hsien, Kiangsu.

More farmers in North China purchase raw materials for clothing than in East Central China, the proportion being 90 per cent for the former and 69 per cent for the latter. Another interesting difference between the two regions is that nearly one-third of the farmers in East Central China purchase ready-made clothing as compared with 2.4 per cent in North China. This may be caused by a greater specialization and possibly by a desire for a better or a different type of clothing.

Shelter

The value of the shelter furnished was estimated on the basis of rent as ten per cent of the value of the farmer's residence. Since the residence and the part of the farm buildings used for farm purposes are often in adjoining rooms or sometimes in the same room, one-half of the farm buildings is estimated as residence. For all households rent amounted to $11.32 per household; for North China it was over one-half that for East Central China. The percentage of rent value to the value of all goods consumed was 5.3 for all families with little variation between the two sections. Families in Kiangning Hsien (S), Kiangsu, who live mostly in brick houses with tile roofs, have the highest rent value of $24.80, and the families in Su Hsien, Anhwei, where almost without exception every farmer lives in a mud-walled, thatch-roofed house, have the lowest value for rent of $4.35. In general these two places typify the housing in East Central and North China. There are, of course, many variations. In Kiangsu the thatched, mud-walled, earth-floored houses exist beside those with tile roofs and brick walls. Usually, although not always, the poorer farmers live in the former. Not only is wealth distinguished in this way but also the nativity of the farmers and this has been discussed in greater detail under the topic, value of goods consumed.

In the United States rent for farm households amounts to 12.5 per cent of the total goods consumed and averages Gold $199.60 per household. This great difference between the two countries is to be expected when one considers the equally great difference in size and materials of house construction.

In China the average farmer's home is a shelter only; it combines to a greater or less extent the function of both a residence and a barn. The home is the storehouse for the grain held for sale or for several months' food supply for the family. In Lienkiang Hsien, Fukien, this storage is conspicious; there is a second storey to the house, giving it a tower-like effect, and this is used as the granary. Farm tools and equipment, especially, hang on the walls of the home as does also some of the produce, particularly seeds for next year's planting. Only rarely does one find attempts at adornment with

36. *A view of one of the villages near Chenhuachen, Kiangning. The houses are well constructed. This section is one to which officials often retired when Nanking was the capital in the Ming Dynasty. The surrounding fields and even the village is similar to the one included in the farm layout (Map I, Chapter II).*

37. *A temple, and at the left a theatrical stage, near Nanking. Such stages are used by travelling of actors once or twice a year.*

pictures, paint, or even whitewash. Windows are small, unscreened but usually latticed, and covered with paper in winter and are immovable. Kiangning Hsien (S), Kiangsu, is the only region studied where window glass is used. During all but hot weather sleeping is done in unventilated rooms. Most houses have no ceilings, but are open to the rafters. Figures 1 and 2 in the chapter on farm layout and land utilization give some idea of the residence arrangements.

During big storms in the summer time the earth-walled houses on the plains in North China often collapse from the melting of the walls in the wind-driven rain; or in case floods come and reach the walls of the houses the earth soon dissolves. During a long storm the collapse of the houses means the loss of all stored grain for food and seed and it is this which greatly intensifies the famine problem. Long time credit for the building of better houses and possibly of granaries appears to be one of the solutions. For instance, in Japan well built granaries separate from other buildings are a conspicious part of the farmstead.

Another question about the type of house the farmer lives in is that of health and cleanliness. There is less incentive to be very tidy in the type of house described than in one having a brick or wooden floor, smooth walls, a ceiling, and a good chimney. More important is the fact that without screens flies and mosquitoes abound in untold numbers and win a large toll of sickness and death.

The Chinese farmer's home is largely a place for shelter only and often is even inadequate for this. There is little about it to create the finer feelings usually associated with a home, and this will undoubtedly always remain true until farm women have at least a primary school education.

Fuel and Light

Fuel bulks large in the value of all goods consumed and amounts to 12.3 per cent, including oil for light (fig. 1). There is very little difference between North and East Central China in the proportion that fuel has to the total value of all goods consumed. Fuel in China has a higher proportion to total value than in a number of other countries because of its scarcity (fig. 4). There are few forests and the use of coal is very limited. The situation has significant agricultural considera-

tions from the standpoint of soil productivity and is discussed in the chapter dealing with maintenance of soil fertility.

The value of fuel and light per household amounts to $25.32 but is one-third less for North China than for East Central China. Most of the fuel consumed in North China is from stalks or straw, the by-products of crops, compared with a significant proportion in East Central China from dried grass and bushes grown on hill, grave, and mountain land. In the great plains region of North China there is little hill land for the growing of grass and bushes, although in such regions as Yenshan Hsien, Chihli, a large amount of similar fuel material grows on alkali or marsh lands unsuitable for cultivation. In Wusiang Hsien, Shansi, which is in a mountainous region, no crop by-products are used for fuel; with the exception of a little firewood burned by 36 per cent of the households to the value of $2.94 per household, it is all from grass and bushes produced on the mountains. The firewood is from the trees grown on the farmstead or along the edges of the fields. The only other region in which firewood is produced on the farm for household use is in Kiangning Hsien, (T) Kiangsu, where 27 per cent of the farmers use wood to the value of $2.37 per household. The wood is produced largely from the trees about the buildings (table 10 and 11).

In Kaifeng Hsien, Honan, 36.9 per cent of the farm households purchased firewood to the value of $7.36, which may be compared with $7.75 for the value of coal purchased and of $15.00 for stalks and straw supplied by the farm.

The fuel problem is an acute one and most farm families in China take pains to limit the use of all fuel. In Yenshan Hsien, Chihli, fuel is so expensive that farmers do not heat water for tea but drink it cold. On the farms of Kiangning Hsien (T), Kiangsu, which are two to five kilometers outside the Taiping gate of Nanking City, grass for fuel is a good money crop and the farmers in order to save fuel cook their rice only once a day, although it would be more appetizing and safe from contamination if cooked freshly for each meal. There is a saying, "What is put under the kettle is worth more than what is put inside." In some places where firewood is used, sticks of wood only partially burned at the time food has finished cooking are taken out of the stove and are saved

for another time by pouring water over them. Coal is beginning to be used more and more and this is true for many of the families at Su Hsien, Anhwei, and Sincheng Hsien, Honan, places located near coal mines. Oil for light constitutes only a small proportion of the fuel and light expense. Few farmers can read or write and many farmers are so poor that they retire early in order to save the expense of oil.

ADVANCEMENT

The expenditures for the different items termed advancement are confined chiefly to religion or local cult practices, recreation in some form or other, to certain social demands, and to formal education (tables 12 and 13 and figs. 6 and 7). Some

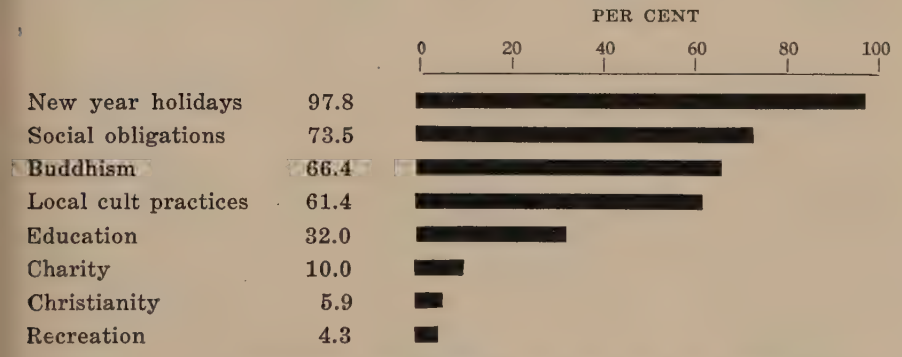

Fig. 6.—Proportion of families having the specified expenditure for advancement.

2370 farm families, 13 localities, six provinces, China (1922-1925).

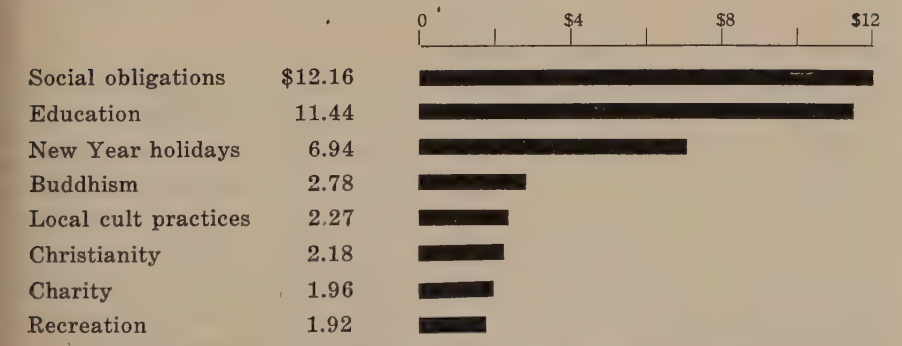

Fig. 7.—Amount of expenditure for advancement for families having the specified items.

2370 farm families, 13 localities, six provinces, China (1922-1925).

TABLE 12. AMOUNT OF EXPENDITURES FOR ADVANCEMENT AND MAINTENANCE OF HEALTH PER FARM FAMILY HAVING SUCH ITEMS

2370 farm families, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Advancement								Maintenance of health
	Social	Education	New Year	Buddhism	Local cult practices	Christianity	Charity	Recreation	Medicine
North China									
Anhwei									
Hwaiyuan	$4.64	$42.38	$5.90	$3.25	$...	$3.85	$1.00	$3.00	$8.49
Su	11.06	30.89	9.16	1.60	...	2.41	2.17	2.71	6.63
Chihli									
Pingsiang	1.85	4.53	1.70	0.45	...	2.83	0.93	8.00	1.04
Yenshan (1922)	2.98	8.77	3.87	0.90	1.01	...	...	...	3.37
Yenshan (1923)	2.92	14.67	2.90	0.26	1.40	0.80	1.17	...	1.85
Honan									
Sincheng	2.03	3.96	6.01	2.52	...	2.57	0.90	0.97	1.27
Kaifeng	1.60	3.90	4.32	1.49	...	0.80	0.74	...	1.70
Shansi									
Wusiang	4.59	14.68	3.21	0.94	1.39	...	...	...	5.29
Weighted average	*5.28*	*15.17*	*4.97*	*1.24*	*1.26*	*2.18*	*1.49*	*1.92*	*3.83*
East Central China									
Anhwei									
Laian (1922)	...	23.00	18.06	...	1.46	...	...	...	11.14
Fukien									
Lienkiang	11.83	3.55	4.66	12.59	5.77	...	...	...	7.37
Kiangsu									
Kiangning (S)	39.11	5.97	12.95	2.81	2.67	...	70.00	...	...
Kiangning (T)	23.09	4.22	6.88	3.12	...	...	5.50	...	3.14
Wuchin	8.33	11.71	9.31	2.12	...	2.15	3.14	...	4.80
Weighted average	*21.14*	*7.87*	*9.81*	*5.08*	*4.04*	*2.15*	*6.00*	...	*4.98*
13 localities Weighted average,	*12.16*	*11.44*	*6.94*	*2.78*	*2.27*	*2.18*	*1.96*	*1.92*	*4.40*

of these expenditures for so-called advancement do not really develop the farmer or the members of his family either socially, spiritually, or even economically, and this may be particularly true in respect to some forms of his cult practices.

One is surprised to find that in China 8.9 of all goods consumed is for advancement purposes while farmers in the United States have the smaller proportion of 6.6 per cent. This may be accounted for by the omission of land taxes for educational work for the farmers of the United States, and by the inclusion for Chinese farm families of the items of New Year holidays and social obligations which may in part rightly belong under some other classification. Automobile expenses for the farm family in the United States have been classified under operating expenses whereas a part, at least, might well be placed under advancement.

TABLE 13. PERCENTAGE OF FARM FAMILIES HAVING EXPENDITURES FOR ADVANCEMENT AND MAINTENANCE OF HEALTH

2370 farm families, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Advancement								Maintenance of health
	New Year	Social	Buddhism	Education	Local cult practices	Charity	Christianity	Recreation	Medicine
North China									
Anhwei									
Hwaiyuan	99.2	82.3	3.2	12.9	...	1.6	21.0	0.8	44.4
Su	99.3	98.3	55.2	19.2	...	35.3	9.8	17.8	45.8
Chihli									
Pingsiang	99.3	15.8	55.3	10.5	...	3.9	2.6	0.7	5.3
Yenshan (1922)	100.0	96.0	86.7	22.0	89.3	...	...	...	12.0
Yenshan (1923)	97.7	97.0	64.7	19.5	13.5	11.3	23.3	...	39.1
Honan									
Sincheng	100.0	91.7	88.2	18.1	...	19.4	12.5	34.7	94.4
Kaifeng	99.3	64.4	93.3	32.2	...	39.6	8.1	...	65.1
Shansi									
Wusiang	98.0	31.1	85.3	60.2	95.6	...	...	...	18.3
Weighted average	*99.1*	*71.0*	*67.3*	*26.7*	*23.2*	*15.2*	*8.6*	*7.4*	*39.1*
East Central China									
Anhwei									
Laian (1922)	98.0	...	...	26.0	85.0	...	...	...	11.0
Fukien									
Lienkiang	78.9	49.7	96.9	59.0	82.0	...	...	...	75.8
Kiangsu									
Kiangning (S)	99.0	99.0	21.2	34.0	3.0	0.5	...	...	...
Kiangning (T)	100.0	100.0	94.5	37.3	...	0.9	...	...	79.7
Wuchin	100.0	85.7	76.0	38.7	...	7.3	6.7	...	73.3
Weighted average	*96.1*	*77.0*	*64.4*	*39.4*	*22.7*	*2.5*	*2.0*	...	*53.6*
Weighted average, 13 localities	*97.8*	*73.5*	*66.4*	*32.0*	*25.9**	*10.0*	*5.9*	*4.3*	*45.1*

*For a number of localities there are no reports of expenditures for local cult practices, chiefly because they have been reported under other items or have not been included in the returns. For this reason an average of 61.4 per cent by localities gives a more accurate impression. This percentage is used in fig. 6.

Social obligations

Classification of social obligations (交際費) is made under advancement with some uncertainty whether it should be there or under the item of "personal" because no details were collected as to the exact nature of the expenditure. The original idea was to include here only items pertaining to demands upon the farmer to contribute to community functions or affairs regardless of his interest in these activities, but such items usually are taken care of by expenditures under the heading of religion or recreation. The nature of items that are included under social obligations are gifts, theatre parties with food and gambling afterwards, and tea house treats at marketing time. Drinking

tea with friends has distinct social advantages and is the farmer's chief means of obtaining news. Social obligations were reported for nearly all farm families in some of the regions, although in two regions this item is as low as 16 and 31 per cent of the total farm families. It is the largest expense under advancement and amounts to $12.16 per family. East Central China farmers among whom drinking at tea houses is prevalent, expend four times as much per family as in North China, which is significant of the difference in the social contacts of the two groups of farmers.

Education

Of the present generation of farm operators less than one half have ever attended school and there is little difference in the two regions of North China and East Central China (table 14). There is, however, the considerable range between localities of 5.9 per cent of farmers having no education in Kiangning(S) Hsien, Kiangsu, to 98.5 per cent having no education in Chinhai Hsien, Chekiang. Those who had some education averaged only 4.1 years in school, but in this average the advantage is slightly with North China operators, 4.3, as compared with 3.9 years for those of East Central China. In both regions tenants have been in school a shorter time than the owners; nearly three-fourths of the tenants, in fact, have not attended school at all. This is an interesting contrast to owners, nearly one-half of whom have had some education. Even those tenants who have had school experience have had only 2.9 years as compared with 4.3 for owners.

With this low percentage of education among the operators of this generation the question naturally presents itself—what of their children? Do farmers want to give their children more education than they themselves had? The answer is here; 70 per cent of children on farms between the ages of 7 and 16 years inclusive are not in school. The range between localities is from 18.7 per cent not in school in Wusiang Hsien, Shansi, to 96.6 per cent at Wuhu Hsien, Anhwei.

Only about one-third of the farm families reported expenses for education of one or more members, but of those who have the expense it was the largest cost for advancement, amounting to $11.44 per family. Educational expenses stand next to the

TABLE 14. EDUCATION OF THE FARM OPERATORS ACCORDING TO LAND TENURE AND OF THE CHILDREN IN THE FARM FAMILY

2866 farm families, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Per cent of farmers having no education				Average number of years of schooling for farmers having education				Per cent of total children between the ages of 7 and 16 inclusive who have not attended school
	Owners	Part owners	Tenants	All operators	Owners	Part owners	Tenants	All operators	
North China									
Anhwei									
Hwaiyuan ..	81.0	...	...	88.1	2.9	...	...	3.0	79.7
Su	53.0	...	...	65.7	4.8	...	...	4.9	78.7
Chihli									
Pingsiang.. ..	51.6	...	...	53.3	2.8	...	...	2.8	89.3
Yenshan (1922)	78.7	...	...	78.7	5.8	...	...	5.8	77.9
Yenshan (1923)	62.8	...	...	62.4	4.8	...	...	4.7	75.9
Honan									
Sincheng	52.1	...	...	63.2	5.8	...	...	5.7	86.1
Kaifeng	7.8	...	...	7.4	4.6	...	...	4.7	76.6
Shansi									
Wusiang	52.7	...	...	53.0	3.9	...	...	3.7	18.7
Wutai	2.2	...	...	23.0	4.3	...	...	3.4	...
Average by localities ..	*49.1*	*64.3**	*53.1**	*54.4*	*4.4*	*4.7**	*2.6**	*4.3*	*72.9*
East Central China									
Anhwei									
Laian (1921) ..	23.9	...	...	48.5	3.1	...	...	2.6	67.2
Laian (1922) ..	20.5	...	...	31.0	2.9	...	...	2.8	75.2
Wuhu..	50.0	...	...	55.9	5.1	...	...	5.0	96.6
Chekiang									
Chinhai	100.0	...	...	98.5	0	...	...	4.0	66.7
Fukien									
Lienkiang.. ..	63.9	...	...	63.4	2.4	...	...	2.5	45.9
Kiangsu									
Kiangning (S).	0.8	...	...	5.9	4.8	...	...	4.6	39.7
Kiangning (T).	33.3	...	...	63.1	4.6	...	...	4.1	80.0
Wuchin	28.1	...	...	31.0	5.6	...	...	5.4	58.9
Average by localities ..	*40.1*	*46.1**	*73.8**	*49.7*	*4.1*	*4.0**	*3.3**	*3.9*	*66.3*
Average by 17 localities ..	*44.3*	*54.3**	*65.6**	*52.2*	*4.3*	*4.2**	*2.9**	*4.1*	*69.6*

*The number of reports for part owner and tenants for any one locality is so small that percentages are significant only for totals.

highest item under advancement for the Chinese farmer, while they are first for the farmer in the United States (fig. 7). Only 26.7 per cent of the North China farm families have educational expenses as compared with 39.4 per cent in East Central China. However, the amount spent for education per family having the expense is nearly twice as much for the North China as for the East Central China families. A larger measure of

self-support in North China may account for this condition, or payment of education in East Central China may be indirect, such as by land taxes.

The education given in these village schools attended by the operator has been almost exclusively of the old classical type, where ancient books are memorized. Such learning has little value for the practical life of the farmer, especially since he attends school at best but two or three years and after a few years forgets most of the characters he learned as a child. At no time has he, if he be average, read well enough to read a book or newspaper, and he is, in fact, still illiterate. For instance, reading matter is an important item for American farmers, whereas it is non-existent for Chinese farmers. The chief advantage is one of slight social prestige to a family having a son in school.

New Year holidays. As for New Year holidays, it is only natural that practically all the farmers should have expenditures for this national time of celebration. Logically the items for the New Year holidays belong under religion, recreation, and food but have not been so distributed; first, because of the significance of these expenditures for these particular holidays and because the farmers can more easily report them as one unit. Farmers have so little relief from the monotony of farm life that much of the New Year's expenses seem to be legitimate. The question is, however, whether more frequent holidays rather than so many days of leisure at one time would not be better both from a mental and a physical viewpoint. There are very sound scientific reasons alone for regular days of rest and change.

Be this as it may, the fact remains that to the average farmer, as to all others, the annual holiday is one long anticipated. A little money is used for religious observances, when, usually before the first day of the New Year, incense and paper money is bought and burned to special gods as prayers for past and future success and favor. Red paper mottoes signifying various hopes for good luck, chiefly connected with financial success, are posted on the front doors of the farmhouses, and in some places even on market baskets and implements.

There is spent upon recreation at this time more than at any other one time in the year. As far as possible at least one new article of clothing is provided for each member of the

33. *Listening to the story-teller as a recreation. Some knowledge is also gained thereby, since many of his stories are taken from history.*

family, if it be only a pair of shoes apiece. A few firecrackers may be purchased, and a little money set aside for gambling and drinking.

Food expense is perhaps more definitely increased than the other two items. Not only does the family plan to have a little extra in the way of pork, chicken, and fish, but sweet cakes, if possible, made with lard, are prepared or bought in readiness for guests who call on New Year's day.

The holidays may last from one or two days for the very poor, to about one-half a month for the well-to-do. Five days is the average for hired labor to be freed from work.

Religion

Local cult practices. The studies were made, in general, without regard to the religious affiliations of the farmers. Religion of some sort, however, is a part of the life of the average farmer. Buddhism and Taoism provide him with numerous idols and of these he chooses to worship those he thinks will protect and help him.

Local cult practices have two chief purposes; one is social and is concerned with physical welfare, and takes the form of prayers and burning of incense for peace from disturbances, for birth of sons, and freedom from sickness; the other is economic and is for special help in animal and crop production, and is expressed in prayers and sacrifices for good crops, and for staying of natural forces of destruction such as flood, drought, wind, insects and diseases. If the gods do not answer these prayers, the farmers nevertheless continue to make them, year after year, century after century, since they have been taught by the priests that if they are not answered it is because of man's sin, not because of the incapacity of the gods. That man can by use of nature's laws overcome many calamities is entirely unknown and unthought of. Plant breeding, the use of insecticides and fungicides, and many other scientific agricultural practices are unknown to the vast majority of farmers. The farmer's efforts to obtain better crops and a happier life are misdirected through such cult practices, and not only do not bring his desires, but actually bring him loss.

Buddhist and Taoist priests work upon the farmer's fears of the unknown and extract money by promising to buy escape from hell for him and for his relatives, or to procure a better

existence for him in the future. The presence of these priests is imperative at funerals for chanting and carrying on services.

In general, cult practices and attendant activities seem to give no constructive help to the farmer, except the change and recreation of idol processions and festivals. Whatever good there may be in the purer forms of Buddhism and Taoism is often not made manifest to the busy and simple-minded farmer, who is not learned enough to grasp a higher mystic philosophy nor leisured enough to practise it.

Christianity. Christian farmers are represented in seven out of seventeen localities and constitute 5.9 per cent of the total farm operators. The highest percentage is for Yenshan Hsien, (1923) Chihli, and is 23.3, and the next highest for Hwaiyuan Hsien, (the Keng Village) Anhwei, and amounts to 21 per cent. The annual average church contributions of these 139 families who made such expenditures was $2.18. This is a little less than that spent by other farm families for Buddhism or local cult practices, but probably cannot be increased greatly beyond that—perhaps at most doubled upon the present income. The Christian farmers of the Keng Village, one of the few villages in China with a large proportion of Christians, contributed to the church $3.85 per family, which is the highest amount for any locality. Farmers in the United States (1) contribute annually Gold $28.20 per family to church, Sunday school, and missions. This when changed to an equivalent currency basis gives a ratio of 1 to 24.2 in favor of the American farmer. This ratio is much greater than that of 1 to 16.6 showing the difference in total value of goods for the two groups of farmers. This is to be expected because the lower standard in China makes it necessary for the farmer to spend proportionately more on the physical necessities of life.

No comparative data have been compiled on the differences between farmers or between a community whose chief religion is Christianity and others whose religion is idolatrous. The Keng Village (Hwaiyuan Hsien, Anhwei) has a large number of Christians, and comparing its present condition to its former, when Christianity was not a predominating influence, the following facts were reported by the villagers themselves and corroborated by observers living in the neighborhood; gambling is no longer carried on and the village for a radius of 60 kilometers is known as the village of no gambling; opium

smoking is stopped; in former times the village had been famous for its lawsuits, but now these are practically nonexistent; the economic condition of the farmers is much improved and this is shown by the decrease in indebtedness. While other factors may contribute to these changes also, still the fact remains that Christianity has been the chief outside influence in the village (4).

Charity

The item of charity was reported by 15.2 per cent of North China families compared with only 2.5 per cent of the farm families in East Central China. The reason for the difference is not known but may be because of its taking some form other than direct giving in East Central China. Evidently most farm families either do not give to charity or consider the item too small to report. The form of this charity was not recorded but it averages $1.96 per family having the expenditure. The item occurs for all but four of the regions.

Recreation

Recreation is associated with religious practices and for this reason it has been difficult to determine absolutely the amount expended for it or the number of families having the item. The data presented indicate that only 4.3 per cent of the families have recreation, although probably no family actually passes a year without some form of it. Many families probably had no public recreation apart from idol processions, other than cult practices, or festive and worship days at temples. Investigators did not always give the same classification to a particular activity, for in some cases idol processions were included as a recreation item and in others under local cult practices. The activity itself often varies in its exact character with the locality, and this has been included with religion in some localities and with recreation in others. Four localities only, therefore, are reported as having any expenditures for recreation and these are all in North China. Of course, not infrequently, recreation is obtained without direct cost. Theatricals given under the auspices of temples are a good example.

In general, gambling is considered recreation. For instance, in certain parts of Shansi, it is the custom to save one dollar

for gambling at New Year's time. No matter what the financial condition of the family, this amount is set aside as a necessary expenditure. If one does not gamble at New Year's time he is considered as too good a man. There is a saying that one should not entirely refuse to gamble, only the game should not be played for making money but for recreation. If the one dollar is lost, it is the custom then to stop gambling; if the game is won, however, gambling may be continued for five days.

The annual cost of recreation for those families reporting this item separately from other items is $1.92 per family. Farm families in the United States spent Gold $22.50 per family each year but in making any comparison one should remember that Chinese farm families have recreation which does not appear apart from other activities such as religion.

FURNISHINGS

Furniture and furnishing in the farmer's home are at a minimum as is shown by the average expenditure for all families of $1.63 per family and with little variation between North and East Central China. The fact that it is only seven-tenths of one per cent of total expenditures indicates the meagerness of furniture and adornment in the home. One only has to visit the average farm home to be impressed with this fact. All the furniture is of the simplest and most utilitarian sort, and in quantity scarcely enough to satisfy the daily demand of beds, a table, a few benches, and a cookstove of earth holding at best two iron caldrons.

HEALTH

Not quite one half of the farmers reported expenditures for health. North China farm families having such expenses amounted to 39.1 per cent of the total, while in East Central China it is 53.6 per cent. The average cost of medicines and doctor's services is $4.40 per family. No qualitative data in relation to health were collected, so no judgment can be passed in regard to the effectiveness of the treatment received. It is, however, commonly observed that some of the treatment is based upon religious customs rather than on scientific knowledge. The farmer, at least in extremity, is willing to pay for medical care, even when it is incompetent. Burning incense to idols,

39. *A close-up of a native physician's pharmacy. Some of the medicines are of true value, others are worthless.*

or other forms of worship, all of which cost money, play an important part in the attempt to keep well or to find cures for ailments. Such expenses have been included under religion.

PERSONAL

Expenditures for tea, tobacco, ornaments, gambling, and liquor constitute important items classified as personal, both from the standpoint of amount of money spent and from the number of farm families having such expenses (table 15 and 16 facing each other and figs. 8 and 9).

Over four-fifths of all farm families reported expenditures for tobacco, the proportion being a little greater for East Central China than for North China families. The average value of tobacco purchased is $3.66 per family using it.

That more tea is consumed in East Central China than in North China is shown by the fact that two-thirds of the farm families in East Central China are expending money for tea as

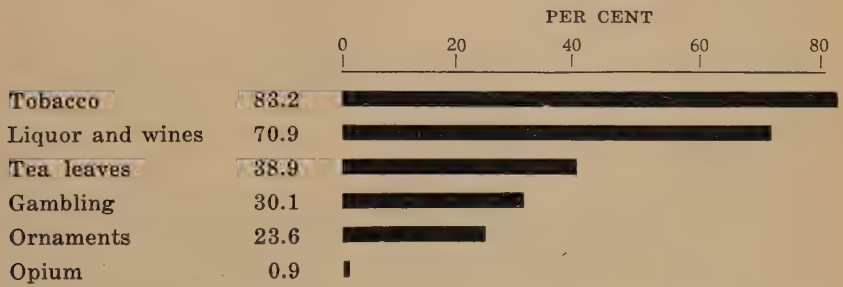

Fig. 8.—Proportion of families having the specified item of goods consumed classified as personal.
2370 farm families, 13 localities, six provinces, China (1922-1925).

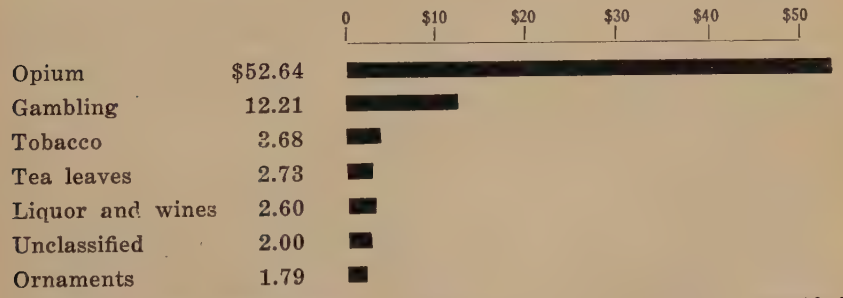

Fig. 9.—Value per household having of all goods consumed classified as personal.
2370 farm families, 13 localities, six provinces, China (1921-1925).

TABLE 15. AMOUNT OF PERSONAL EXPENDITURES PER FAMILY HAVING SUCH ITEMS FURNISHED BY THE FARM OR PURCHASED

2370 farm families, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm		Purchased						
	Tobacco†	Tea leaves*	Opium	Gambling	Tobacco†	Tea leaves*	Liquor and wine	Unclassified	Ornaments
North China									
Anhwei									
Hwaiyuan	$6.00	$0.20	$24.00	$17.18	$1.61	$0.89	$1.97	$2.00	$4.00
Su	7.17	...	95.33	9.83	2.67	1.35	2.66	...	2.88
Chihli									
Pingsiang	...	...	14.00	5.40	0.51	0.43	0.51	...	1.75
Yenshan (1922)	...	...	...	3.73	1.18	...	0.78	...	...
Yenshan (1923)	1.08	...	30.00	3.24	1.35	0.47	2.00	...	3.52
Honan									
Sincheng	...	2.50	10.00	9.58	3.22	0.51	0.53	...	0.96
Kaifeng	...	...	20.00	9.17	1.56	0.67	1.63	...	1.00
Shansi									
Wusiang	...	...	...	11.30	2.74	...	1.83	...	...
Weighted average	*4.74*	*0.97*	*50.57*	*7.39*	*2.05*	*1.02*	*1.73*	*2.00*	*1.85*
East Central China									
Anhwei									
Laian (1922)	...	...	...	29.89	2.59	3.50	1.73	...	...
Fukien									
Lienkiang	...	...	...	15.84	14.28	1.17	10.09	...	...
Kiangsu									
Kiangning (S)	...	...	...	12.66	2.28	6.87	1.52	...	...
Kiangning (T)	...	4.00	36.67	17.99	3.66	2.90	2.12	...	1.86
Wuchin	...	...	68.00	14.54	5.64	1.35	2.38	...	1.36
Weighted average	...	*4.00*	*56.25*	*16.15*	*5.76*	*3.44*	*3.61*	...	*1.64*
Weighted average, 13 localities	*4.74*	*1.73*	*52.64*	*12.21*	*3.66*	*2.74*	*2.60*	*2.00*	*1.79*

*The average amount per household having tea leaves supplied by the farm and purchased is $2.73 for all households, $1.02 in North China and $3.44 in East Central China.

†The average amount per household having tobacco supplied by the farm and purchased is $3.68 for all households, $2.10 for North China and $5.76 for East Central China.

compared with only one-fifth in North China. The East Central China farmers' tea expense is over three times that of the North China farmers and amounts to $3.44 per family.

Nearly one per cent of all the farm families have expenditures for opium. The proportion and the amount of $52.64 expended per family smoking it is approximately the same for North as for East Central China.

Gambling debts were reported for nearly one-third of all the farm families. Some farmers may have failed to report because of the onus connected therewith, particularly if money is lost at the game. If we assume that as many farmers won as lost in gambling, then the number of gamblers doubles. The proportion of farm families having gambling debts in North China is 23 per cent and the average loss is $7.39 per farm

TABLE 16. PERCENTAGE OF FARM FAMILIES HAVING PERSONAL EXPENDITURES FURNISHED BY THE FARM OR PURCHASED

2370 farm families, 13 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm		Purchased						
	Tea leaves*	To-bacco†	To-bacco†	Liquor and wine	Tea leaves*	Gambling	Ornaments	Opium	Unclassified
North China									
Anhwei									
Hwaiyuan	1.6	2.4	85.5	72.6	21.0	17.7	0.8	0.8	0.8
Su	...	2.1	87.8	82.5	52.4	25.2	21.0	2.1	...
Chihli									
Pingsiang	...	...	38.8	28.3	9.9	3.3	1.3	2.0	...
Yenshan (1922)	...	...	94.7	94.7	...	41.3	...	...	...
Yenshan (1923)	...	3.8	86.5	39.8	31.6	62.4	67.7	0.8	...
Honan									
Sincheng	0.7	...	59.0	46.5	4.9	4.2	68.8	1.4	...
Kaifeng	...	...	91.3	34.9	18.1	30.9	99.3	0.7	...
Shansi									
Wusiang	...	...	89.2	89.2	...	9.6	...	...	...
Weighted average	*0.2*	*1.0*	*80.5*	*65.3*	*19.2*	*23.0*	*23.3*	*1.0*	*0.1*
East Central China									
Anhwei									
Laian (1922)	...	...	78.0	78.0	16.0	27.0	...	...	...
Fukien									
Lienkiang	...	...	97.5	97.5	19.3	75.8	...	...	...
Kiangsu									
Kiangning (S)	...	...	87.2	87.2	90.1	50.7	...	...	...
Kiangning (T)	0.5	...	97.2	97.7	96.3	33.6	40.1	1.4	...
Wuchin	...	...	76.0	50.0	70.7	22.7	24.0	1.7	...
Weighted average	*0.1*	...	*86.7*	*78.9*	*66.4*	*40.1*	*16.2*	*0.8*	...
Weighted average, 13 localities	*0.2*	*0.6*	*83.1*	*70.9*	*38.7*	*30.1*	*23.6*	*0.9*	—

*All households having tea leaves both purchased and supplied by the farm amount to 38.9 per cent; for North China 19.4 per cent, and for East Central China 66.5 per cent.

†Tobacco was supplied by the farm and purchased for 83.2 per cent of all households, 80.8 per cent of North China households and 86.7 per cent of East Central China households.

family. In East Central China 40 per cent have such debts to the amount of $16.15 per farm family. Not only is gambling a time-consuming occupation but it is an expensive one which costs one-third of the farmers $12.21 per family.

Liquor and wine average $2.60 per family for 70.9 per cent of the families. In North China 65.3 per cent of the farm families have the expense amounting to $1.73 per family, while in East Central China 78.9 per cent spend $3.61 per family for liquor and wine.

The average expenditure for ornaments by 23.6 per cent of the farm families reporting the item is $1.79.

These expenditures upon gambling, drinking, and opium smoking if spent upon education or more wholesome forms of diversion or savings would do much to raise the standard of

TABLE 17. AMOUNT OF UNCLASSIFIED EXPENDITURES PER FARM FAMILY HAVING SUCH ITEMS FURNISHED BY THE FARM OR PURCHASED

1503 farm families, 8 localities, four provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm	Purchased				
	Miscellaneous	Weddings	Funerals	Lawsuits	Servants	Others
North China						
Anhwei						
Hwaiyuan	$ ...	$70.67	$42.38	$ ...	$ ...	$ 5.08
Su	...	80.53	186.25	82.33	18.00	...
Chihli						
Yenshan (1922)	3.52	...	...	...	...	...
Yenshan (1923)	...	30.38	19.86	7.94	10.00	...
Honan						
Sincheng	...	25.42	24.44	50.00	8.00	...
Kaifeng	...	23.20	23.67	...	5.00	...
East Central China						
Kiangsu						
Kiangning (T)	...	84.00	75.00	...	20.00	20.00
Wuchin	...	131.05	56.90	...	2.63	...
Weighted average, 8 localities	*3.52*	*69.43*	*52.68*	*40.50*	*11.09*	*6.14*

living. Greater economic improvement without corresponding progress in social and spiritual growth is more likely to increase bad habits than to improve the well being of the farmer and his family (4). Experience seems to show that both economic and social improvement must go together.

UNCLASSIFIELD

Funerals

Of all the farm families studied 2.8 per cent had funeral expenses to pay during the year amounting to $52.68 per family. The expenditure per family in North China is $50.15, while in East Central China it is $62.07. Social custom demands heavy expenditures for funerals or one loses prestige in the community. In North China 3.7 per cent of the farmers had funeral expenses compared with only 1.4 per cent in East Central China. The higher percentage for North China is partially caused by the extremely large percentage of 15.8 for Yenshan Hsien (1923), Chihli. Whether at Yenshan Hsien there is

TABLE 18. PERCENTAGE OF FARM FAMILIES HAVING UNCLASSIFIED EXPENDITURES FOR ITEMS FURNISHED BY THE FARM OR PURCHASED

1503 farm families, 8 localities, four provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Furnished by the farm	Purchased				
	Miscellaneous	Weddings	Funerals	Servants	Lawsuits	Others
North China						
Anhwei						
Hwaiyuan	...	4.8	6.5	...	...	10.5
Su	...	6.6	2.8	3.5	2.1	...
Chihli						
Yenshan (1922)	10.0	...	...	...	...	...
Yenshan (1923)	...	6.0	15.8	0.8	6.0	...
Honan						
Sincheng	...	8.3	6.3	0.7	0.7	...
Kaifeng	...	10.1	4.0	0.7	...	...
East Central China						
Kiangsu						
Kiangning (T)	...	4.6	1.8	0.5	...	0.5
Wuchin	...	6.3	3.3	2.7	...	...
Weighted average, 8 localities	*0.6*	*3.8*	*2.8*	*0.9*	*0.6*	*0.6*

any relation between the drought of that year, which caused almost a total failure of the crop, and the number of funerals is not known.

Weddings

Weddings, like funerals, are more common in North China. The proportion of all families having weddings is 3.8 per cent; for North China it is 4.3 per cent and for East Central China 2.9 per cent. The cost of weddings averages $69.43 apiece. In East Central China the average is $114.83 as compared with $47.50 in North China; weddings, like funerals, are expensive affairs because of the social prestige that it is felt one must maintain among his fellow men.

Lawsuits

Only six-tenths of one per cent of all farm families reported items for lawsuits. The only locality reporting such expenditures are Su Hsien, Anhwei; Yenshan Hsien (1923), Chihli,

and Sincheng Hsien, Honan. The average cost per family having them is $40.50.

Servants

Only a few well-to-do farm families have servants. Nine-tenths of one per cent have such expenditures, and this amounts to $11.09 per family.

Other expenses

A few families, six-tenths of one per cent, have expenditures not falling within any of the mentioned classifications.

Land tenure and standards of living

Type of land tenure sometimes determines standards of living and for this reason a classification has been made of the principal groups of expenditures for owner, part owner, and tenant households (table 19). Tenants appear to have a somewhat lower standard in that expenditures for other than the four necessities are 3.7 per cent less than for owner farmers in the same localities. The outstanding difference is found at Su Hsien, Anhwei, where the owners spend twice as much, 24 per cent, for goods other than the necessities as do tenants who use only 12 per cent of their budget for these same purposes. The difference is chiefly in food, the tenants spending 67.2 per cent of their budget for food as compared with 57.4 per cent for the owners. While the difference in standard does not appear to be very great, still it is to be expected from the information given in the chapter on farm tenancy and ownership where it is shown how the tenant farmer has a smaller income to live upon than does the owner.

In summary, when the two sections, North China and East Central China are compared, it is apparent that the standard of living is appreciably higher in East Central China. This is manifested in two ways; first, the proportion of total goods consumed is less for physical necessities in East Central China, and second, more is expended upon physical necessities, either for quantity or quality or for both. If these two regions in China be compared with other countries, the standard in the latter is evidently higher.

TABLE 19. PERCENTAGE DISTRIBUTION BY GROUPS OF VALUE OF GOODS CONSUMED BY OWNER, PART OWNER, AND TENANT HOUSEHOLDS

1987 households, 10 localities, six provinces, China (1922-1925)

Provinces and hsiens in which studies were made	Food			Rent			Clothing			Fuel and light			Others		
	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants	Owners	Part owners	Tenants
North China															
Anhwei															
Hwaiyuan	57.7	59.4	...	3.7	3.2	...	8.8	9.2	...	10.7	7.9	...	19.1	20.3	...
Su	57.4	60.1	67.2	1.8	1.5	1.3	8.5	8.5	7.7	8.3	8.6	11.8	24.0	21.3	12.0
Chihli															
Pingsiang	66.5	65.5	...	10.9	7.4	...	4.6	4.2	...	12.5	17.5	...	5.5	5.4	...
Honan															
Sincheng	75.9	73.6	...	3.0	3.3	...	2.4	2.3	...	11.5	9.9	...	7.2	10.9	...
Kaifeng	76.4	77.4	...	3.9	3.3	...	7.0	7.3	...	5.8	5.9	...	6.9	6.1	...
Shansi															
Wusiang	49.6	52.5	...	5.9	4.6	...	9.6	10.0	...	15.7	17.4	...	19.2	15.5	...
East Central China															
Fukien															
Lienkiang	53.6	52.0	54.4	4.6	5.8	5.1	13.3	13.6	8.3	8.4	8.0	8.5	20.1	20.6	23.7
Kiangsu															
Kiangning (S)	52.4	54.6	...	7.8	6.5	...	11.8	9.7	...	7.4	8.6	...	20.6	20.6	...
Kiangning (T)	49.4	51.5	47.5	2.8	2.1	2.0	7.9	7.8	10.0	14.3	14.4	15.7	25.6	24.2	24.8
Wuchin	65.3	61.4	70.8	6.9	7.2	3.5	2.4	2.2	1.8	8.0	10.2	12.1	17.4	19.0	11.8
*Average (owner and tenant)**	*56.4*	...	*60.0*	*4.0*	...	*3.0*	*8.0*	...	*6.9*	*9.3*	...	*12.0*	*21.3*	...	*18.1*
*Average (part owner and tenant)**	...	*56.2*	*60.0*	...	*4.2*	*3.0*	...	*8.0*	*6.9*	...	*10.3*	*12.0*	...	*21.3*	*18.1*
*Average (owner and part owner)**	*60.4*	*60.8*	...	*5.1*	*4.5*	...	*7.6*	*7.5*	...	*10.3*	*10.3*	...	*16.6*	*16.4*	...

*These averages are by localities.

This low standard of living of farmers in China is reflected in almost every aspect of the farmer's life. Far too high a proportion of his meagre income goes into the necessities to maintain physical life. Even with this his food is unvaried and lacking in the nutriment he needs, his clothing is of the cheapest sort, his home a bare protection from the weather and with little comfort or beauty. Outside influences of education, religion, and social life afford him little help. His education is so rudimentary as to be practically useless to him, both in type and extent, his local cult practices while having some social value probably cost him more than he can afford, and his social life is lacking in recreation and pleasure. That in spite of these grave handicaps he is able to preserve on the whole a cheerful and not unkindly nature is highly to his credit.

One is led inevitably to inquire into the situation which has resulted in this low standard of living. Two aspects seem obvious, one having to do with the question of population and the other with education.

The farmer's standard of living is dependent upon the size of farm which in turn is determined by the density of farming population. Previous chapters have shown how profits increase with the increasing size of farms, but most farmers must accept the fate of small farms because of the dense population. Industrialization and the development of the professions will relieve the situation but cannot remove enough people from the farms to enlarge very materially the amount of land per capita of farming population. Reclamation and colonization will help a little, but here again all the arable land in the Northwest not now cultivated but which could be either reclaimed or colonized can add only a minute fraction to the present average size of farms for all China. Intensive farming, which is the application of more labor and more capital to the present land resources, is probably the most hopeful way by which a farmer's income may be increased to meet his physical, social, and spiritual needs. The methods by which this can be done are discussed in the concluding chapter.

But even though the farmer's income be increased to an amount adequate for his needs, it is doubtful whether he can profit by it until he is educated to desire those things essential to his real welfare. Until he is so educated it is only too likely that a surplus of income would be used for excessive opium,

gambling, or other unfortunate forms of self-indulgence. An example of this is in years of good crops, when the farmers spend too much of their extra funds in gambling, excessive drinking, and gorging themselves with food.

The farmer has been made ignorant by several conditions of his environment. Poor communications have kept him isolated in small groups of persons like himself, the inadequacy of this education has kept him illiterate, and the impractical nature of such education as he can get tends to make him consider learning useless to him. There has been little in his surroundings to open his mind, enlarge his vision, or suggest a better way of doing things. There is a Chinese proverb which says "To learn to be a farmer one need not study; one needs only to do as his neighbor does" (種地不要學人家怎着咱怎着). The solution to this problem of ignorance must come with time, when compulsory education is made a law and enforced and schools are provided for the country as well as the city; schools where farmers can be taught what they need to enrich themselves not only materially, but in those things pertaining to socialization not less essential to the happiest and most fruitful human life.

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CHAPTER XII

CONCLUSION

In summarizing the material accumulated in this study of 2866 farms in seventeen localities and seven provinces of China, too sweeping conclusions cannot be drawn. The number of farms, while large enough to be considered representative of the localities, must yet fall short of the detail and the number necessary for laying down wide assertions for the whole country. China is a land about which it is peculiarly difficult to generalize. Many of the country districts are isolated and maintain to this day their ancient customs of speech, habit, and farming methods. Regions geographically close may yet by reason of poor communications preserve more or less their individual qualities. Nevertheless, from the particular groups of farms here studied, certain broad conclusions seem to form themselves, and without being unduly assertive, these may be generally stated.

The basis of Chinese agriculture is a farm system of unfenced scattered plots of land for the most part inherited, difficult of management from the farmsteads which are usually located in villages or hamlets of varying size. These villages and hamlets dot the landscape about as thickly as do the solitary farmsteads in the United States, and this signifies a dense population as well as a rural social system entirely different from that in most western countries.

The area per farm, while small, is not as small as it at first appears, because much of the land produces two crops a year and the crops are all food or fiber crops for direct human utilization rather than a significant proportion being grown for animal food. In fact, two thirds of all the animals raised are for draft purposes and the consequent animal density is so low that from the standpoint of fertility maintenance the farms are lightly stocked. Not only this, but by-products of crops such as stalks, which in western countries are to a large extent fed to animals and much organic matter thus returned

to the soil, in China are chiefly burned for fuel and the ashes only are returned to the soil.

The farm land is generally worked by owners, although approximately one-fifth is farmed by tenants and another one-fifth by part owners, the extent of tenancy varying from almost none to nearly one hundred per cent tenants in some localities. Systems of rent are quite similar to those found in other countries. Rental charges, however, are often not fair either for the tenant or the landlord and on the average rents should be reduced something over one-fifth the present amount.

Not only is the area of land worked by the farmer in China small, but he has also far smaller capital and equipment than the western farmer. In fact, his main investment is labor, but even this is not very great since the Chinese farm averages only two men giving full time to the farm business compared with approximately one and one-half men in the United States. The relatively small amount of labor used on the limited amount of land is partly because the farm business is not sufficiently enlarged by the use of more intensive methods of farming.

The production from the farm business in China and in the United States is remarkably equal in quantity per unit of land, although the method of obtaining these products are entirely different. In the United States the chief means has been the use of capital as well as labor; in China it has been by the use of labor, for the most part human labor, and with very little capital. The resulting production per unit of labor in the United States is apparently at least twenty-five fold greater than in China. Because of the dense population and the high cost of capital, it is evident, therefore, that the great natural resources of China is her man power. What she has to do is to learn how to make the most of this immense resource, because, on the whole, neither human nor animal labor is used to its full capacity.

Farm profits, therefore, with little equipment, a small amount of land, relatively low efficiency in the use of labor, and rather extensive types of crops and methods of farming, must necessarily be small also. The farms in the largest size-group show more efficient use of capital and labor than in the other groups, and give much higher profits. But it is evident that in general there is a dearth of capital, and one of the

essential needs of the Chinese farmer is that he be able to obtain somewhere credit at reasonable rates of interest.

The remedies for this too small size of farm business are difficult to find. Colonization seems scarcely the solution, since lands for such extensive colonization as would be needed are limited, even in Manchuria and the Northwest. Moreover, unless something is done to check the growth of population, colonization will do little permanent good. The same may be said of drawing men from the land to industry. As China becomes modernized, it is inevitable that industries will develop and a certain number of the country people be absorbed into them. Yet it can scarcely be hoped that sufficient numbers of them will be so absorbed as to relieve the present agricultural situation very much. The best future solution of the problem seems to be in some method of population control, and the best immediate solution, more intensive methods of raising crops and the growing of crops that produce more food per unit of land. Such productivity, however, will also be useless if population continues to grow.

Nevertheless, even after taking into consideration this pressure of population and the somewhat primitive methods of farming in China, no great immediate change seems possible. The Chinese farmer has by the trial and error method arrived at many sound and practicable conclusions for his situation. His crops are often suited to the soil, and his cropping systems follow the general principle of rotation remarkably well. He does need help, however, in adjusting such cropping systems to the new changing demands of markets and prices, to dietary needs, and in some cases even to soil and climatic conditions; and in order to increase his yields, he needs help in procuring better seeds, in control of insects and pests, and in more intensive methods of fertilization and cultivation. In general, soil is insufficiently fertilized, and if transportation were better and credit available, it would be possible for the farmer to secure the needed fertilizers. Improved transportation, credit, and better marketing facilities would also enable the farmer to raise more and better products.

The small size of business and the crowded population have led necessarily to a standard of living that is low when compared to the standard of the western farmer. The farmhouse in China lacks comfort, beauty, and even the elements of

sanitation necessary for health and well-being. Diet, while remarkable in containing many of the elements needed for health and strength, lacks variety mainly in fruits and vegetables, particularly in North China. The direct utilization of grains and to a certain extent of soybeans, however, is probably a more economical procedure than the western way of using so much food largely through animals.

The farmer's life, moreover, needs to be enriched mentally as well as materially. Few of the farmers of China have enough education to enable them to profit from reading, and since three-fourths of the children of farmers are not in school, there seems little chance for immediate improvement in this respect. The farmer cannot be blamed for this directly, since the type of old-fashioned classical school, which has been the only one for him to attend, has not been one to give him any practical help or inspiration. His life seems meagre in recreation, although that he is a social creature is shown by the regular, though small, items expended yearly for tea-drinking with friends, religious cults, and like activities.

The relation of the findings of this study to the causes of famines must also command some attention. While a study of only one year's business in a locality does not reveal all the facts necessary to an understanding of the causes of famines, nevertheless, some of these causes are brought to light.

A small business, the result of over-population, especially in those regions periodically subjected to famine from drought, flood, insect pests, or like causes, means little reserve for the years of crop failure. Farm population in such localities fares well if crops return even an average yield, but crop failures, especially in successive years, spell ruin for all but the most prosperous. This situation is aggravated by the absence of the same credit, marketing, and transportation facilities which would also make possible the enlargement of the farm business. Of course, big engineering schemes for controlling rivers and for irrigation will do much to prevent the tremendous losses now incurred when crops are grown almost to maturity only to be destroyed, perhaps, by floods. Afforestation, also, would do much to prevent erosion and the consequent filling of stream channels resulting in flood. But in the absence of these enterprises, credit and transportation would alleviate greatly the seriousness of famine years.

In closing these chapters it seems pertinent to question the worth of such a study as this, involving as it has an immense amount of labor and no small cost. Of what value is it to those of us who live in the East and in the West to know these details of farm life in China? In the first place little is known of the actual conditions of farming in China. Generalizations have been made from casual observations, but the accuracy of these generalizations can only be tested by the meticulous use of schedules and figures applied to and gathered from individual farms. Such data are essential not only in conveying the truth about China to westerners, but to the Chinese as well. China has been a country without reliable statistics, and it is to her advantage to obtain them, not only from the point of view of taking her place in world statistics, but also for the important reason of self-knowledge before there can be self-improvement. This study was begun with the idea of collecting accurate data on Chinese farming conditions to teach to Chinese college students, and not only data, but methods of collecting such information, so that these students might in the future discover for themselves the facts of their own country.

But beyond this, there is yet other value in having made this study, slight as it must appear in the future when many others more profound and more useful will be made. In the age which is upon us the question of international relations is an outstanding one. If we are to live at peace with each other as nations in the world, it must be upon a basis of mutual understanding and cooperation. China has not hesitated to study and to appreciate the West and to adopt as quickly as she has been able many of the western methods of thought and education, particularly in science. But the West has not so readily reciprocated, partly because of self-absorption, and partly because of the difficulties of making such studies. Yet if there is to be real understanding between nations, it must be mutual. We cannot know a people until we know accurately their conditions of life, and research, the collection and analysis of facts, is a constructive contribution to international welfare in so far as it promotes this understanding.

Research, therefore, into the life of the farmers of China is in this way constructive international work. Since so large a proportion of China's people are farmers, it is fitting that the primary emphasis on understanding China should be laid

on understanding her rural life. If we are to estimate and appreciate the agriculture of China, we must know about her soils, her crops, her livestock, her conditions of land ownership, in short, about all those situations which limit or affect, in one way or another, the lives of millions of China's people, and doom them to ignorance and poverty, or lead them to affluence and freedom. Such study is the more difficult because of the wide diversity of the conditions in various parts of the country, but not the less necessary.

If these chapters contribute, therefore, in any measure to this two-fold purpose, the furnishing of information to Chinese students regarding some phases of the agriculture of their own country and the adding to that gradually accumulating body of accurate knowledge about China, a country so rich in every kind of human experience, for the benefit of those of international mind, the work of these many months is finished.

APPENDICES

APPENDIX I

TABLE 1. RELATION OF SIZE OF FARM TO 30 VARIABLES†

124 farms, Hwaiyuan Hsien, Anhwei, China (1924-1925)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)					
	Small	Medium small	Medium	Medium large	Large	All farms
Profits:						
1. Farm earnings	$ 9.18	39.89	82.07	133.81	205.04	79.47
2. Operator's labor earnings	$–14.89	–9.36	–2.77	23.00	–0.01	–2.91
3. Farm labor earnings	$–14.85	–9.42	–4.98	23.48	–0.08	–3.12
4. Family earnings	$ 76.26	102.28	158.04	209.55	376.49	164.97
5. Family earnings per adult-male unit	$ 29.15	28.99	37.68	49.31	57.83	41.76
6. Labor returns	$ 17.46	48.78	83.89	130.64	188.14	80.97
7. Labor returns per man-equivalent	$ 15.76	28.02	36.90	52.18	53.57	33.92
8*						
9. Net profits per crop mow	$ –3.24	–1.02	–0.59	–0.09	–0.12	–1.32
10. Income from other than farm sources	$ 35.39	15.14	13.06	16.32	72.20	30.33
Size of business:						
11. Farm area	11.4	27.6	48.0	67.1	112.5	46.1
12. Crop area	10.7	25.9	44.8	63.4	106.2	43.4
13. Crop mow	17.0	42.4	72.0	107.0	165.7	70.0
14. Man-work units	68.3	150.6	249.6	377.9	572.2	247.1
15. Man-equivalent	1.21	1.79	2.41	2.69	3.98	2.21
16. Animal-work units	25.9	49.0	83.4	126.1	193.7	95.3
17. Index of double cropping	160.	164.	162.	170.	157.	162.
18. Size of family (adult-male units)	2.6	3.5	4.2	4.8	6.5	4.0
19. Farm capital	$300.38	616.22	1088.09	1379.07	2563.95	1032.36
20. Farm receipts per mow‡	$ 4.94	4.60	4.22	4.38	4.45	4.46
21. Farm expenses per mow‡	$ 4.08	3.06	2.39	2.27	2.52	2.63
Labor efficiency:						
22. Man-work units per man-equivalent	65.2	91.7	109.1	147.8	152.6	105.8
23. Crop mow per man-equivalent	16.5	25.7	31.5	42.1	43.8	29.5
24. Animal-work units per labor animal unit	43.1	47.4	52.0	77.6	72.1	63.5
25. Crop mow per labor animal unit	36.4	41.0	45.0	65.9	61.7	56.1
26. Value of family and hired labor per crop mow	$ 1.89	1.36	1.19	0.98	1.12	1.17
Quality of business:						
27. Crop index	104.	99.	101.	96.	103.	100.
28. Land value per mow‡	$ 19.26	15.57	17.06	15.65	17.21	17.14
Capital efficiency:						
29. Capital per mow§ in buildings	$ 5.30	3.28	2.47	2.36	2.83	2.91
30. Capital per mow§ in implements	$ 0.43	0.80	0.83	0.52	0.54	0.60
31. Interest on capital investment per mow‡	$ 2.25	1.91	1.94	1.74	1.93	1.90

*Variable number 8 was purposely deleted after the type was set.

†The variables for these seventeen localities (tables 1–17) are the average for each farm during the period of one year. The unit for land measure is the local mow. Most of the factors were calculated for each individual farm and the average here presented is the sum of the value of each factor on each farm divided by the number of farms. Exceptions to this are family earnings per adult-male unit, labor returns per adult-male unit, receipts per mow, expenses per mow, animal-work units per labor animal unit, crop mow per labor animal, capital per mow in buildings, capital per mow in implements, and interest on capital investment per mow. For these factors the gross values for each size-group were divided by the number of farms in the group. This method was used because these factors were added later in the process of analysis and the more laborious and time consuming process of computing for each farm did not seem worth the cost in light of the fact that for a number of these factors actual comparison shows no great difference between the weighted average and the average of average. Net profits per crop mow is an exception in that the weighted average and the average are quite different. The value for animal-work units are the average of farms having such units rather than an average of all farms and are used because some farms borrow or hire animals. Since many of these values are averages of averages they cannot be used to compute values for other variables in the table with the expectation that the same results will be obtained.

‡Crop area.

§Farm area.

TABLE 2. RELATION OF SIZE OF FARM TO 30 VARIABLES
286 farms, Su Hsien, Anhwei, China (1923-1924)

Variables	Average of each variable for specified size of farm group (farm area)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$ 61.09	214.26	395.14	216.84
2. Operator's labor earnings	$ 23.37	93.84	110.42	73.36
3. Farm labor earnings	$ 23.61	94.94	99.80	70.33
4. Family earnings	$104.82	253.82	410.95	250.21
5. Family earnings per adult-male unit	$ 30.45	48.56	58.39	48.48
6. Labor returns	$ 40.80	142.53	202.41	124.65
7. Labor returns per man-equivalent	$ 60.83	101.26	74.96	77.86
8*				
9. Net profits per crop mow	$ 0.19	1.06	0.36	0.51
10. Income from other than farm sources	$ 35.61	25.33	75.67	45.47
Size of business:				
11. Farm area	12.8	43.1	132.7	61.1
12. Crop area	11.3	39.1	124.1	56.5
13. Crop mow	19.7	69.5	192.8	91.3
14. Man-work units	78.3	224.0	563.5	280.9
15. Man-equivalent	0.84	1.59	2.94	1.75
16. Animal-work units	30.9	76.1	230.9	127.2
17. Index of double cropping	175.	178.	156.	170.
18. Size of family (adult-male units)	3.4	5.2	7.0	5.2
19. Farm capital	$468.44	1491.51	3691.75	1831.37
20. Farm receipts per mow	$ 8.66	7.49	4.64	5.54
21. Farm expenses per mow	$ 3.25	2.01	1.46	1.71
Labor efficiency:				
22. Man-work units per man-equivalent	112.6	151.3	206.8	155.1
23. Crop mow per man-equivalent	27.8	48.0	70.8	48.0
24. Animal-work units per labor animal unit	30.6	42.4	76.5	60.6
25. Crop mow per labor animal unit	27.5	38.9	63.9	51.9
26. Value of family and hired labor per crop mow	$ 0.83	0.65	0.45	0.52
Quality of business:				
27. Crop index	119.	118.	92.	100.
28. Land value per mow	$ 32.00	28.26	24.03	28.26
Capital efficiency:				
29. Capital per mow in buildings	$ 2.67	1.59	1.24	1.42
30. Capital per mow in implements	$ 0.79	1.04	0.64	0.74
31. Interest on capital investment per mow	$ 3.32	3.05	2.38	2.59

*Variable number 8 was purposely deleted after the type was set.

TABLE 3. RELATION OF SIZE OF FARM TO 30 VARIABLES
152 farms, Pingsiang Hsien, Chihli, China (1923-1924)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$ 53.77	83.78	162.39	102.23
2. Operator's labor earnings	$ 22.39	26.66	32.50	27.39
3. Farm labor earnings	$ 21.89	25.85	32.45	26.94
4. Family earnings	$ 62.61	103.95	207.98	127.86
5. Family earnings per adult-male unit	$ 26.16	33.45	46.56	37.71
6. Labor returns	$ 28.99	43.60	74.95	50.12
7. Labor returns per man-equivalent	$ 27.61	38.23	45.29	37.38
8*				
9. Net profits per crop mow	$ −2.62	−0.39	0.15	−0.90
10. Income from other than farm sources	$ 3.75	8.16	21.70	11.58
Size of business:				
11. Farm area	7.2	15.7	35.9	20.2
12. Crop area	6.4	14.0	30.6	17.5
13. Crop mow	8.2	17.4	36.9	21.4
14. Man-work units	31.4	62.3	133.7	77.9
15. Man-equivalent	1.01	1.22	1.87	1.39
16. Animal-work units	11.8	21.2	45.9	34.1
17. Index of double cropping	130.	125.	121.	125.
18. Size of family (adult-male units)	2.5	3.1	4.4	3.4
19. Farm capital	$398.56	724.09	1624.32	941.12
20. Farm receipts per mow	$ 10.14	7.92	7.57	7.96
21. Farm expenses per mow	$ 1.68	1.93	2.26	2.11
Labor efficiency:				
22. Man-work units per man-equivalent	32.2	56.1	72.3	54.3
23. Crop mow per man-equivalent	9.3	15.9	21.0	15.6
24. Animal-work units per labor animal unit	14.7	20.6	39.1	31.4
25. Crop mow per labor animal unit	15.4	21.7	41.6	33.4
26. Value of family and hired labor per crop mow	$ 0.81	0.97	1.13	1.05
Quality of business:				
27. Crop index	102.	89.	103.	100.
28. Land value per mow	$ 38.01	34.18	33.46	35.14
Capital efficiency:				
29. Capital per mow in buildings	$ 13.86	8.90	8.40	9.14
30. Capital per mow in implements	$ 0.44	0.38	0.62	0.54
31. Interest on capital investment per mow	$ 5.01	4.14	4.25	4.31

*Variable number 8 was purposely deleted after the type was set.

TABLE 4. RELATION OF SIZE OF FARM TO 30 VARIABLES

150 farms, Yenshan Hsien (1922), Chihli, China (1922-1923)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)				
	Small	Medium small	Medium large	Large	All farms
Profits:					
1. Farm earnings	$ 46.63	78.72	$103.73	$178.76	$100.67
2. Operator's labor earnings	$ 23.07	38.03	38.72	58.54	39.68
3. Farm labor earnings	$ 23.07	38.03	38.72	58.54	39.68
4. Family earnings	$ 77.70	98.96	133.40	240.61	135.14
5. Family earnings per adult-male unit	$ 34.19	28.02	30.98	38.70	33.31
6. Labor returns	$ 39.42	67.98	95.80	214.97	102.30
7. Labor returns per man-equivalent	$ 50.06	57.29	70.68	87.27	65.73
8*					
9. Net profits per crop mow	$ –0.11	0.46	0.33	0.37	0.28
10. Income from other than farm sources	$ 28.21	10.50	9.94	15.06	15.33
Size of business:					
11. Farm area	7.6	15.6	24.6	52.5	24.5
12. Crop area	7.6	14.9	23.6	47.2	22.8
13. Crop mow	12.2	22.8	36.5	71.4	34.9
14. Man-work units	49.8	93.3	146.8	287.5	141.2
15. Man-equivalent	0.89	1.27	1.54	2.49	1.54
16. Animal-work units	20.4	30.0	46.0	90.9	54.4
17. Index of double cropping	161.	153.	155.	152.	155.
18. Size of family (adult-male units)	2.3	3.5	4.3	6.2	4.1
19. Farm capital	$294.66	508.61	812.66	1502.56	762.38
20. Farm receipts per mow	$ 8.65	7.60	7.26	7.10	7.36
21. Farm expenses per mow	$ 2.49	2.33	2.87	3.31	2.94
Labor efficiency:					
22. Man-work units per man-equivalent	60.8	81.6	108.3	118.9	91.8
23. Crop mow per man-equivalent	14.6	19.9	27.1	29.5	22.6
24. Animal-work units per labor animal unit	46.6	51.8	71.1	62.5	61.9
25. Crop mow per labor animal unit	37.1	40.9	56.4	49.1	48.8
26. Value of family and hired labor per crop mow	$ 0.36	0.51	0.58	0.77	0.63
Quality of business:					
27. Crop index	107.	102.	101.	100.	100.
28. Land value per mow	$ 20.92	17.78	19.59	18.19	18.98
Capital efficiency:					
29. Capital per mow in buildings	$ 13.23	9.04	7.96	6.00	7.55
30. Capital per mow in implements	$ 0.47	0.59	0.71	0.81	0.72
31. Interest on capital investment per mow	$ 3.11	2.72	2.75	2.55	2.67

*Variable number 8 was purposely deleted after the type was set.

TABLE 5. RELATION OF SIZE OF FARM TO 30 VARIABLES
133 farms, Yenshan Hsien (1923), Chihli, China (1923-1924)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$ 21.70	53.87	113.65	62.31
2. Operator's labor earnings	$–11.12	–45.85	–136.73	–63.48
3. Farm labor earnings	$–11.42	–46.76	–137.55	–64.16
4. Family earnings	$ 48.82	110.82	184.83	113.77
5. Family earnings per adult-male unit	$ 21.31	27.89	33.81	29.27
6. Labor returns	$ –0.68	–3.11	–42.41	–15.00
7. Labor returns per man-equivalent	$ –0.88	–2.39	–12.08	–5.00
8*				
9. Net profits per crop mow	$ –2.77	–1.88	–1.52	–2.07
10. Income from other than farm sources	$ 18.38	22.58	10.24	17.17
Size of business:				
11. Farm area	13.4	37.4	87.7	45.6
12. Crop area	12.8	35.0	80.4	42.2
13. Crop mow	18.4	51.1	115.3	60.8
14. Man-work units	76.9	201.1	441.7	236.9
15. Man-equivalent	1.02	1.74	2.83	1.85
16. Animal-work units	33.5	64.3	140.8	97.0
17. Index of double cropping	139.	146.	142.	142.
18. Size of family (adult-male units)	2.3	4.0	5.5	3.9
19. Farm capital	$414.04	1257.98	3140.07	1580.93
20. Farm receipts per mow	$ 3.02	3.35	3.28	3.27
21. Farm expenses per mow	$ 1.32	1.81	1.86	1.79
Labor efficiency:				
22. Man-work units per man-equivalent	80.9	125.9	160.9	122.0
23. Crop mow per man-equivalent	19.6	32.0	42.0	31.0
24. Animal-work units per labor animal unit	82.6	108.0	88.0	93.0
25. Crop mow per labor animal unit	65.8	86.6	72.1	75.6
26. Value of family and hired labor per crop mow	$ 0.56	0.81	0.79	0.78
Quality of business:				
27. Crop Index	86.	96.	102.	100.
28. Land value per mow	$ 25.17	26.74	29.90	27.23
Capital efficiency:				
29. Capital per mow in buildings	$ 5.32	3.99	3.34	3.77
30. Capital per mow in implements	$ 0.42	0.69	1.07	0.90
31. Interest on capital investment per mow	$ 2.59	2.88	3.12	3.00

*Variable number 8 was purposely deleted after the type was set.

TABLE 6. RELATION OF SIZE OF FARM TO 30 VARIABLES

144 farms, Sincheng Hsien, Honan, China (1923-1924)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)				
	Small	Medium small	Medium large	Large	All farms
Profits:					
1. Farm earnings	$117.74	200.54	304.89	703.77	269.0
2. Operator's labor earnings	$ 43.08	66.80	77.75	271.69	91.0
3. Farm labor earnings	$ 38.82	63.31	72.38	275.41	87.9
4. Family earnings	$176.23	290.40	416.11	689.66	340.2
5. Family earnings per adult-male unit	$ 44.00	59.16	61.98	94.15	63.4
6. Labor returns	$ 90.72	137.34	181.43	403.67	170.5
7. Labor returns per man-equivalent	$ 37.41	47.42	44.41	89.71	49.9
8*					
9. Net profits per crop mow	$ 0.64	0.86	0.61	1.54	0.8
10. Income from other than farm sources	$ 21.21	35.95	56.60	17.30	33.5
Size of business:					
11. Farm area	18.4	33.4	56.1	106.0	44.0
12. Crop area	17.8	32.5	54.8	104.6	43.0
13. Crop mow	31.4	55.4	93.0	174.9	73.1
14. Man-work units	105.4	181.0	298.3	560.9	236.9
15. Man-equivalent	2.48	3.23	4.34	5.37	3.55
16. Animal-work units	57.4	97.9	165.3	319.8	129.9
17. Index of double cropping	177.	170.	171.	169.	172.
18. Size of family (adult-male units)	4.0	4.9	6.7	7.3	5.4
19. Farm capital	$986.48	1715.33	2906.39	5354.47	2263.2
20. Farm receipts per mow	$ 9.75	8.69	7.94	8.26	8.4
21. Farm expenses per mow	$ 3.12	2.52	2.38	1.53	2.2
Labor efficiency:					
22. Man-work units per man-equivalent	46.5	63.7	73.3	123.2	69.2
23. Crop mow per man-equivalent	13.9	19.5	22.9	38.4	21.3
24. Animal-work units per labor animal unit	92.4	97.0	99.4	123.1	104.1
25. Crop mow per labor animal unit	50.6	55.0	55.9	68.1	58.2
26. Value of family and hired labor per crop mow	$ 1.49	1.23	1.09	0.74	1.06
Quality of business:					
27. Crop index	104.	101.	100.	98.	100.
28. Land value per mow	$ 46.36	44.42	44.03	43.24	44.70
Capital efficiency:					
29. Capital per mow in buildings	$ 4.01	3.12	4.30	4.00	3.82
30. Capital per mow in implements	$ 0.51	0.77	0.96	0.71	0.77
31. Interest on capital investment per mow	$ 4.45	4.22	4.25	4.09	4.21

*Variable number 8 was purposely deleted after the type was set.

TABLE 7. RELATION OF SIZE OF FARM TO 30 VARIABLES

149 farms, Kaifeng Hsien, Honan, China (1923-1924)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)				
	Small	Medium small	Medium large	Large	All farms
Profits:					
1. Farm earnings	$139.66	253.23	390.18	629.41	330.52
2. Operator's labor earnings	$ 81.76	137.19	194.31	269.57	174.55
3. Farm labor earnings	$ 81.76	137.13	195.28	270.66	175.03
4. Family earnings	$184.20	289.45	426.73	643.90	392.76
5. Family earnings per adult-male unit	$ 43.17	58.26	68.39	88.07	68.48
6. Labor returns	$107.65	172.23	271.09	434.96	250.29
7. Labor returns per man-equivalent	$ 83.17	99.71	104.43	113.49	101.58
8*					
9. Net profits per crop mow	$ 0.84	1.09	1.22	1.01	1.06
10. Income from other than farm sources	$ 23.42	10.36	1.51	1.35	7.68
Size of business:					
11. Farm area	16.7	35.2	60.2	112.6	57.3
12. Crop area	15.9	34.1	58.4	109.0	55.5
13. Crop mow	26.9	58.7	99.6	183.5	94.2
14. Man-work units	63.4	141.1	236.2	433.9	223.6
15. Man-equivalent	1.38	1.80	2.72	3.89	2.47
16. Animal-work units	58.7	125.4	211.4	385.0	198.5
17. Index of double cropping	168.	172.	171.	169.	170.
18. Size of family (adult-male units)	4.3	5.0	6.2	7.3	5.7
19. Farm capital	$723.81	1451.31	2436.02	4484.38	2318.61
20. Farm receipts per mow	$ 11.20	8.88	8.39	7.71	8.29
21. Farm expenses per mow	$ 2.44	1.44	1.71	1.94	1.80
Labor efficiency:					
22. Man-work units per man-equivalent	51.8	82.6	89.8	112.1	86.7
23. Crop mow per man-equivalent	22.0	34.1	38.2	47.4	36.4
24. Animal-work units per labor animal unit	87.5	112.9	104.2	133.8	117.8
25. Crop mow per labor animal unit	42.1	52.8	49.1	63.8	55.8
26. Value of family and hired labor per crop mow	$ 0.93	0.58	0.75	0.89	0.77
Quality of business:					
27. Crop index	113.	101.	102.	98.	100.
28. Land value per mow	$ 31.83	31.19	30.46	30.60	30.98
Capital efficiency:					
29. Capital per mow in buildings	$ 4.09	4.59	4.91	4.36	4.53
30. Capital per mow in implements	$ 0.83	0.93	0.95	0.91	0.92
31. Interest on capital investment per mow	$ 3.64	3.41	3.33	3.29	3.34

*Variable number 8 was purposely deleted after the type was set.

TABLE 8. RELATION OF SIZE OF FARM TO 30 VARIABLES

251 farms, Wusiang Hsien, Shansi, China (1922)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)					
	Small	Medium small	Medium	Medium large	Large	All farms
Profits:						
1. Farm earnings	$ 41.80	75.44	107.55	157.40	228.19	118.4
2. Operator's labor earnings	$ 23.58	41.86	51.27	77.17	67.65	51.2
3. Farm labor earnings	$ 23.24	41.62	50.92	75.39	65.10	50.3
4. Family earnings	$ 66.74	97.52	140.73	185.86	301.93	154.1
5. Family earnings per adult-male unit	$ 24.62	36.51	36.17	46.89	70.77	44.9
6. Labor returns	$ 26.98	47.50	66.34	102.46	152.43	76.5
7. Labor returns per man-equivalent	$ 40.50	54.80	59.18	85.44	80.32	62.9
8*						
9. Net profits per crop mow	$ –2.82	–0.61	–0.17	0.62	0.41	–0.4
10. Income from other than farm sources	$ 26.54	23.48	34.57	30.72	66.01	35.4
Size of business:						
11. Farm area	8.0	15.2	25.3	35.6	63.1	28.4
12. Crop area	7.9	15.1	25.0	35.6	62.7	28.2
13. Crop mow	8.0	15.4	25.9	37.6	65.6	29.4
14. Man-work units	45.6	82.2	131.1	186.7	313.9	146.7
15. Man-equivalent	0.77	0.95	1.15	1.26	2.00	1.21
16. Animal-work units	...	26.8	41.0	57.8	95.9	54.1
17. Index of double cropping	101.	102.	104.	106.	105.	103.
18. Size of family (adult-male units)	2.7	2.7	3.9	4.0	4.3	3.4
19. Farm capital	$232.06	422.81	707.81	1025.08	2038.09	851.6
20. Farm receipts per mow	$ 6.05	5.92	5.44	5.70	5.54	5.6
21. Farm expenses per mow	$ 0.77	0.93	1.15	1.27	1.90	1.4
Labor efficiency:						
22. Man-work units per man-equivalent	67.8	95.2	116.9	153.6	174.0	119.4
23. Crop mow per man-equivalent	12.2	18.0	23.4	31.0	33.3	23.1
24. Animal-work units per labor animal unit	...	99.9	102.6	101.3	95.1	98.5
25. Crop mow per labor animal unit	...	60.3	64.9	65.9	65.0	64.5
26. Value of family and hired labor per crop mow	$ 0.21	0.23	0.48	0.60	1.24	0.7
Quality of business:						
27. Crop index	101.	99.	96.	101.	102.	100.
28. Land value per mow	$ 20.63	20.93	21.08	22.04	23.81	21.6
Capital efficiency:						
29. Capital per mow in buildings	$ 5.76	4.47	3.92	3.80	5.28	4.64
30. Capital per mow in implements	$ 0.52	0.46	0.46	0.49	0.47	0.47
31. Interest on capital investment per mow	$ 2.34	2.24	2.26	2.31	2.60	2.41

*Variable number 8 was purposely deleted after the type was set.

TABLE 9. RELATION OF SIZE OF FARM TO 30 VARIABLES
226 farms, Wutai Hsien, Shansi, China (1922-1923)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)					
	Small	Medium small	Medium	Medium large	Large	All farms
Profits:						
1. Farm earnings	$157.37	295.58	551.81	587.66	852.26	458.11
2. Operator's labor earnings	$ 77.21	112.03	91.66	96.90	168.08	108.45
3. Farm labor earnings	$ 77.21	171.13	336.86	356.23	548.31	277.52
4. Family earnings	$207.48	236.85	144.23	147.57	225.55	197.20
5. Family earnings per adult-male unit‡	...	...	...	...	...	...
6. Labor returns	$135.45	181.59	193.06	209.38	293.00	198.20
7. Labor returns per man-equivalent	$ 64.80	81.17	69.28	67.91	91.73	75.40
8*						
9. Net profits per crop mow	$ 0.51	1.26	1.89	1.72	2.08	1.45
10. Income from other than farm sources†	...	...	...	...	...	...
Quality of business:						
11. Farm area	50.2	87.2	154.7	181.5	238.8	133.8
12. Crop area	49.5	86.0	152.8	176.5	236.6	131.7
13. Crop mow	49.5	86.0	152.8	176.5	236.6	131.7
14. Man-work units	242.1	415.7	742.1	850.7	1133.4	635.7
15. Man-equivalent	2.10	2.26	2.85	3.08	3.22	2.64
16. Animal-work units	79.2	131.6	232.8	259.1	357.3	199.3
17. Index of double cropping	100.	100.	100.	100.	100.	100.
18. Size of family‡ (adult-male units)	...	...	...	...	...	...
19. Farm capital	$1002.49	1556.48	2686.84	2892.91	3799.43	2257.33
20. Farm receipts per mow	$ 4.61	4.45	4.45	4.14	4.23	4.32
21. Farm expenses per fow	$ 1.43	1.01	0.84	0.81	0.63	0.84
Labor efficiency:						
22. Man-work units per man-equivalent	116.3	185.8	266.4	275.8	355.0	230.8
23. Crop mow per man-equivalent	23.8	38.4	54.9	57.2	74.1	47.8
24. Animal-work units per labor animal unit	71.9	83.2	114.2	115.2	114.5	102.5
25. Crop mow per labor animal unit	45.0	54.3	75.0	78.4	75.8	67.8
26. Value of family and hired labor per crop mow	$ 1.17	0.80	0.66	0.62	0.52	0.66
Quality of business:						
27. Crop index	102.	100.	103.	98.	98.	100.
28. Land value per mow	$ 15.21	13.91	14.02	12.77	12.96	13.81
Capital efficiency:						
29. Capital per mow in buildings	$ 2.83	2.35	2.08	2.06	1.98	2.15
30. Capital per mow in implements	$ 0.19	0.14	0.09	0.07	0.06	0.09
31. Interest on capital investment per mow	$ 1.62	1.45	1.41	1.31	1.28	1.37

*Variable number 8 was purposely deleted after the type was set.
†No information was obtained.
‡Number of persons per family was incompletely reported.

TABLE 10. RELATION OF SIZE OF FARM TO 30 VARIABLES

101 farms, Laian Hsien (1921), Anhwei, China (1921-1922)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)				
	Small	Medium small	Medium large	Large	All farms
Profits:					
1. Farm earnings	$171.53	317.65	417.24	542.49	369.59
2. Operator's labor earnings	$ 65.07	125.79	159.95	168.16	132.01
3. Farm labor earnings	$ 83.20	169.04	227.45	271.04	191.49
4. Family earnings	$274.23	405.77	468.23	597.06	443.09
5. Family earnings per adult-male unit	$ 87.95	96.94	103.10	109.59	101.27
6. Labor returns	$218.16	352.54	425.20	574.50	399.87
7. Labor returns per man-equivalent	$ 69.84	87.25	94.98	95.05	87.38
8*					
9. Net profits per crop mow	$ −0.37	1.07	1.62	1.66	1.05
10. Income from other than farm sources†	...	...	...	...	...
Size of business:					
11. Farm area	31.8	61.7	80.0	117.3	74.4
12. Crop area	30.4	59.6	77.1	113.6	71.8
13. Crop mow	44.1	73.3	92.5	124.5	85.2
14. Man-work units	263.7	441.6	557.3	755.4	514.2
15. Man-equivalent	3.14	4.18	4.69	6.42	4.67
16. Animal-work units	70.3	102.5	128.8	178.1	132.4
17. Index of double cropping	146.	123.	120.	110.	124.
18. Size of family (adult-male units)	3.1	4.2	4.5	5.4	4.4
19. Farm capital	$1104.17	1857.54	2372.35	3393.08	2226.26
20. Farm receipts per mow	$ 12.39	10.70	10.30	9.60	10.29
21. Farm expenses per mow	$ 6.75	5.37	4.89	4.82	5.14
Labor efficiency:					
22. Man-work units per man-equivalent	85.4	108.7	122.2	121.1	110.1
23. Crop mow per man-equivalent	14.3	18.1	20.4	20.0	18.3
24. Animal-work units per labor animal unit	48.5	49.3	59.5	48.3	51.3
25. Crop mow per labor animal unit	35.7	35.2	42.7	33.8	36.4
26. Value of family and hired labor per crop mow	$ 3.46	3.09	2.86	3.23	3.13
Quality of business:					
27. Crop index	100.	98.	98.	101.	100.
28. Land value per mow	$ 22.59	20.70	20.76	20.47	21.06
Capital efficiency:					
29. Capital per mow in buildings	$ 7.37	4.93	4.90	4.04	4.77
30. Capital per mow in implements	$ 1.05	0.76	0.72	0.72	0.76
31. Interest on capital investment per mow	$ 2.90	2.49	2.46	2.39	2.48

*Variable number 8 was purposely deleted after the type was set.
†No information was obtained.

TABLE 11. RELATION OF SIZE OF FARM TO 30 VARIABLES

100 farms, Laian Hsien (1922), Anhwei, China (1922-1923)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$ 59.45	118.06	230.67	133.67
2. Operator's labor earnings	$ 7.55	−3.49	63.21	19.94
3. Farm labor earnings	$ 4.77	−4.65	36.49	10.61
4. Family earnings	$181.07	383.64	488.97	352.44
5. Family earnings per adult-male unit	$ 53.92	88.32	83.63	78.51
6. Labor returns	$122.07	195.11	303.98	205.13
7. Labor returns per man-equivalent	$ 54.79	57.98	73.94	61.78
8*				
9. Net profits per crop mow	−2.98	−1.31	−0.31	−1.53
10. Income from other than farm sources	$ 24.52	103.74	114.00	82.26
Size of business:				
11. Farm area	16.6	40.6	83.3	46.0
12. Crop area	16.6	40.5	83.1	45.9
13. Crop mow	25.5	54.2	103.8	60.2
14. Man-work units	176.3	313.1	587.9	353.2
15. Man-equivalent	2.28	3.32	4.06	3.22
16. Animal-work units	48.1	73.4	142.5	94.1
17. Index of double cropping	152.	135.	128.	138.
18. Size of family (adult-male units)	3.4	4.3	5.8	4.5
19. Farm capital	$683.50	1533.83	2427.28	1538.26
20. Farm receipts per mow	$ 14.23	9.40	6.76	8.51
21. Farm expenses per mow	$ 10.66	6.49	3.98	5.59
Labor efficiency:				
22. Man-work units per man-equivalent	79.2	96.1	143.0	104.9
23. Crop mow per man-equivalent	10.7	16.6	25.2	17.3
24. Animal-work units per labor animal unit	32.5	41.3	58.2	47.8
25. Crop mow per labor animal unit	24.4	30.5	42.4	35.1
26. Value of family and hired labor per crop mow	$ 4.41	3.59	2.25	2.99
Quality of business:				
27. Crop index	114.	112.	93.	100.
28. Land value per mow	$ 22.74	21.72	20.53	21.68
Capital efficiency:				
29. Capital per mow in buildings	$ 10.47	7.12	4.17	5.89
30. Capital per mow in implements	$ 1.09	1.04	0.71	0.87
31. Interest on capital investment per mow	$ 3.29	3.03	2.34	2.68

*Variable number 8 was purposely deleted after the type was set.

TABLE 12. RELATION OF SIZE OF FARM TO 30 VARIABLES

102 farms, Wuhu Hsien, Anhwei, China (1921-1922)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)				
	Small	Medium small	Medium large	Large	All farms
Profits:					
1. Farm earnings	$107.19	168.55	266.63	624.05	265.79
2. Operator's labor earnings	$ 32.17	38.40	15.93	149.35	55.56
3. Farm labor earnings	$ 23.59	10.32	−11.57	51.66	16.60
4. Family earnings	$134.21	239.55	345.94	834.02	359.38
5. Family earnings per adult-male unit	$ 47.57	65.44	82.60	120.96	84.21
6. Labor returns	$ 71.46	129.95	166.40	517.12	203.92
7. Labor returns per man-equivalent	$ 48.40	60.10	55.93	91.39	63.93
8*					
9. Net profits per crop mow	$ −4.55	−2.44	−1.91	−0.24	−2.21
10. Income from other than farm sources†	...	...	...	...	...
Size of business:					
11. Farm area	7.9	15.9	25.1	59.8	24.9
12. Crop area	7.9	15.8	24.5	59.0	24.6
13. Crop mow	13.0	27.7	43.6	107.6	44.0
14. Man-work units	84.2	169.0	265.5	652.6	268.2
15. Man-equivalent	1.48	2.20	3.01	5.95	2.97
16. Animal-work units	10.2	16.3	24.7	60.3	29.0
17. Index of double cropping	161.	175.	178.	183.	175.
18. Size of family (adult-male units)	2.8	3.7	4.2	6.9	4.3
19. Farm capital	$1045.14	1977.95	3477.53	7154.93	3114.94
20. Farm receipts per mow	$ 20.39	18.25	18.70	18.88	18.72
21. Farm expenses per mow	$ 6.87	7.56	7.82	8.30	7.92
Labor efficiency:					
22. Man-work units per man-equivalent	53.1	77.3	89.0	110.8	82.5
23. Crop mow per man-equivalent	8.7	12.7	14.6	18.3	13.5
24. Animal-work units per labor animal unit	13.6	15.6	17.2	22.3	18.9
25. Crop mow per labor animal unit	33.0	35.2	42.2	52.6	43.9
26. Value of family and hired labor per crop mow	$ 2.93	3.23	3.39	3.35	3.32
Quality of business:					
27. Crop index	100.	102.	103.	102.	100.
28. Land value per mow	$113.64	111.94	116.00	106.00	111.69
Capital efficiency:					
29. Capital per mow in buildings	$ 11.53	4.97	13.47	10.13	9.11
30. Capital per mow in implements	$ 5.13	3.88	4.72	2.77	3.55
31. Interest on capital investment per mow	$ 10.55	10.03	11.36	9.71	10.12

*Variable number 8 was purposely deleted after the type was set.
†No information was obtained.

TABLE 13. RELATION OF SIZE OF FARM TO 30 VARIABLES

67 farms, Chinhai Hsien, Chekiang, Anhwei (1921-1922)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$184.74	245.52	425.29	281.00
2. Operator's labor earnings	$104.12	127.85	176.10	134.83
3. Farm labor earnings	$107.09	133.77	173.74	137.14
4. Family earnings	$147.04	186.73	328.02	217.39
5. Family earnings per adult-male unit	$ 48.45	46.68	75.04	57.43
6. Labor returns	$128.11	173.41	325.70	205.59
7. Labor returns per man-equivalent	$102.15	118.90	121.76	114.04
8*				
9. Net profits per crop mow	$ 1.18	2.29	2.01	1.82
10. Income from other than farm sources†	...	...	...	...
Size of business:				
11. Farm area	12.2	16.7	34.9	20.8
12. Crop area	12.2	16.7	34.8	20.8
13. Crop mow	13.4	18.7	39.1	23.2
14. Man-work units	159.7	212.4	428.3	262.0
15. Man-equivalent	1.23	1.48	2.70	1.78
16. Animal-work units	...	85.6	181.5	143.1
17. Index of double cropping	110.	112.	112.	111.
18. Size of family (adult-male units)	3.0	4.0	4.4	3.8
19. Farm capital	$970.67	1396.90	3144.33	1798.28
20. Farm receipts per mow	$ 20.70	20.53	19.52	20.04
21. Farm expenses per mow	$ 5.50	5.81	7.31	6.53
Labor efficiency:				
22. Man-work units per man-equivalent	129.1	146.1	159.7	144.5
23. Crop mow per man-equivalent	10.9	12.8	14.5	12.7
24. Animal-work units per labor animal unit	...	88.8	103.0	99.2
25. Crop mow per labor animal unit	...	19.9	22.2	21.6
26. Value of family and hired labor per crop mow	$ 1.72	2.36	3.75	2.97
Quality of business:				
27. Crop index	99.	102.	99.	100.
28. Land value per mow	$ 51.35	53.88	62.74	55.79
Capital efficiency:				
29. Capital per mow in buildings	$ 24.62	22.76	18.70	21.00
30. Capital per mow in implements	$ 3.49	4.09	4.39	4.13
31. Interest on capital investment per mow	$ 6.39	6.70	7.22	6.91

*Variable number 8 was purposely deleted after the type was set.
†No information was obtained.

TABLE 14. RELATION OF SIZE OF FARM TO 30 VARIABLES

161 farms, Lienkiang Hsien, Fukien, China (1922-1923)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$181.91	376.72	896.33	470.33
2. Operator's labor earnings	$116.21	204.44	478.15	258.75
3. Farm labor earnings	$120.81	232.17	532.29	286.68
4. Family earnings	$198.09	368.86	922.67	481.45
5. Family earnings per adult-male unit	$ 66.50	92.80	184.31	121.95
6. Labor returns	$151.57	293.21	680.69	364.28
7. Labor returns per man-equivalent	$133.88	205.16	282.01	204.23
8*				
9. Net profits per crop mow	$ 3.85	6.68	7.92	6.08
10. Income from other than farm sources†	...	...	...	...
Size of business:				
11. Farm area	7.2	15.3	50.9	23.6
12. Crop area	7.2	15.3	50.9	23.6
13. Crop mow	8.3	18.8	56.0	26.7
14. Man-work units	74.8	170.8	475.0	231.9
15. Man-equivalent	1.14	1.39	2.61	1.68
16. Animal-work units	17.3	33.9	91.9	55.4
17. Index of double cropping	114.	121.	116.	117.
18. Size of family (adult-male units)	3.0	4.0	5.0	3.9
19. Farm capital	$763.70	1805.64	4550.53	2295.67
20. Farm receipts per mow	$ 32.49	33.20	22.77	26.13
21. Farm expenses per mow	$ 7.39	8.64	5.17	6.18
Labor efficiency:				
22. Man-work units per man-equivalent	64.1	119.9	180.9	119.4
23. Crop mow per man-equivalent	7.1	13.2	21.3	13.6
24. Animal-work units per labor animal unit	12.6	29.9	72.9	45.0
25. Crop mow per labor animal unit	7.5	17.6	46.2	28.0
26. Value of family and hired labor per crop mow	$ 4.18	4.58	3.57	3.87
Quality of business:				
27. Crop index	95.	99.	101.	100.
28. Land value per mow	$ 64.63	78.32	76.11	72.87
Capital efficiency:				
29. Capital per mow in buildings	$ 25.24	24.51	10.07	14.91
30. Capital per mow in implements	$ 4.12	4.73	1.70	2.63
31. Interest on capital investment per mow	$ 8.43	9.42	7.15	7.79

*Variable number 8 was purposely deleted after the type was set.
†No information was obtained.

TABLE 15. RELATION OF SIZE OF FARM TO 30 VARIABLES

203 farms, Kiangning Hsien (S), Kiangsu, China (1923)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)				
	Small	Medium small	Medium large	Large	All farms
Profits:					
1. Farm earnings	$266.09	315.56	413.68	668.90	429.97
2. Operator's labor earnings	$189.84	198.26	242.74	368.01	255.75
3. Farm labor earnings	$188.17	194.25	240.00	365.90	253.08
4. Family earnings	$292.37	318.09	454.37	834.37	493.17
5. Family earnings per adult-male unit	$ 83.25	88.59	104.87	154.61	115.51
6. Labor returns	$209.66	216.63	316.08	547.83	333.82
7. Labor returns per man-equivalent	$189.32	183.53	181.32	180.75	183.40
8*					
9. Net profits per crop mow	$ 6.58	3.68	3.35	3.12	4.04
10. Income from other than farm sources	$ 24.46	25.35	45.89	131.48	60.44
Size of business:					
11. Farm area	12.0	19.9	29.6	51.9	29.7
12. Crop area	11.3	18.2	27.9	50.3	28.3
13. Crop mow	21.5	36.3	55.1	99.9	56.0
14. Man-work units	165.4	172.8	263.8	465.0	276.8
15. Man equivalent	1.12	1.20	1.82	3.05	1.86
16. Animal-work units	14.3	24.3	33.9	59.7	38.9
17. Index of double cropping	190.	200.	198.	199.	197.
18. Size of family (adult-male units)	3.5	3.6	4.3	5.4	4.3
19. Farm capital	$974.04	1516.38	2171.08	3787.52	2211.19
20. Farm receipts per mow	$ 26.65	19.89	18.89	18.20	19.35
21. Farm expenses per mow	$ 3.17	2.54	4.09	4.89	4.15
Labor efficiency:					
22. Man-work units per man-equivalent	153.0	147.8	153.9	154.2	152.1
23. Crop mow per man-equivalent	21.6	31.3	32.5	33.4	30.2
24. Animal-work units per labor animal unit	14.3	24.3	31.2	35.9	30.8
25. Crop mow per labor animal unit	24.1	38.1	50.7	60.1	50.7
26. Value of family and hired labor per crop mow	$ 0.92	0.49	1.29	1.76	1.37
Quality of business:					
27. Crop index	100.	99.	98.	101.	100.
28. Land value per mow	$ 55.84	56.62	54.99	55.14	55.64
Capital efficiency:					
29. Capital per mow in buildings	$ 22.45	17.47	15.61	15.93	16.67
30. Capital per mow in implements	$ 2.73	2.83	3.01	2.96	2.93
31. Interest on capital investment per mow	$ 6.88	6.67	6.22	6.03	6.25

*Variable number 8 was purposely deleted after the type was set.

TABLE 16. RELATION OF SIZE OF FARM TO 30 VARIABLES
217 Farms, Kiangning Hsien (T), Kiangsu, China (1923-1924)

Variables	Average of each variable for specified size of farm group (farm area)					
	Small	Medium small	Medium	Medium large	Large	All farms
Profits:						
1. Farm earnings	$ 79.81	110.96	131.50	184.87	225.95	148.00
2. Operator's labor earnings	$ 35.07	46.81	41.71	53.93	26.82	41.27
3. Farm labor earnings	$ 19.60	20.23	17.61	28.65	9.56	19.09
4. Family earnings	$141.15	176.56	209.92	296.39	444.18	254.70
5. Family earnings per adult-male unit	45.32	46.44	48.14	54.98	62.50	53.23
6. Labor returns	100.91	147.08	165.48	227.42	259.83	182.08
7. Labor returns per man-equivalent	$ 64.02	61.64	56.73	65.95	56.06	60.59
8*						
9. Net profits per crop mow	$ –1.17	–0.88	–0.83	–0.45	–0.54	–0.76
10. Income from other than farm sources	$ 25.36	6.60	5.23	18.56	64.09	22.70
Size of business:						
11. Farm area	13.9	24.0	34.3	44.6	62.7	36.5
12. Crop area	13.3	23.2	33.6	43.5	61.4	35.6
13. Crop mow	24.6	38.8	51.9	66.3	91.6	55.4
14. Man-work units	154.1	255.5	356.4	485.4	672.3	390.5
15. Man-equivalent	1.66	2.48	3.00	3.69	4.81	3.17
16. Animal-work units	10.0	11.8	12.6	15.4	20.2	15.9
17. Index of double cropping	186.	168.	155.	153.	149.	161.
18. Size of family (adult-male units)	3.1	3.8	4.4	5.4	7.1	4.8
19. Farm capital	$752.66	1134.18	1423.60	1953.08	2704.95	1611.38
20. Farm receipts per mow	$ 13.27	10.98	8.91	9.40	8.45	9.41
21. Farm expenses per mow	$ 7.29	6.20	5.00	5.15	4.78	5.26
Labor efficiency:						
22. Man-work units per man-equivalent	93.2	109.2	124.0	142.1	144.7	123.7
23. Crop mow per man-equivalent	16.7	16.5	18.4	19.9	20.0	18.3
24. Animal-work units per labor animal unit	15.0	19.8	19.7	18.8	15.5	17.4
25. Crop mow per labor animal unit	49.8	70.1	83.9	81.4	71.8	75.5
26. Value of family and hired labor per crop mow	2.62	2.51	2.34	2.56	2.48	2.48
Quality of business:						
27. Crop index	105.	96.	96.	107.	100.	100.
28. Land value per mow	$ 46.36	40.85	35.49	37.24	35.36	38.62
Capital efficiency:						
29. Capital per mow in buildings	$ 4.73	3.43	2.56	2.70	3.65	3.20
30. Capital per mow in implements	$ 1.09	1.10	1.08	1.11	0.96	1.05
31. Interest on capital investment per mow	$ 4.51	3.91	3.39	3.59	3.52	3.62

*Variable number 8 was purposely deleted after the type was set.

TABLE 17. RELATION OF SIZE OF FARM TO 30 VARIABLES

300 Farms, Wuchin Hsien, China (1923-1924)

VARIABLES	AVERAGE OF EACH VARIABLE FOR SPECIFIED SIZE OF FARM GROUP (FARM AREA)					
	Small	Medium small	Medium	Medium large	Large	All farms
Profits:						
1. Farm earnings	$100.80	190.98	268.62	330.19	374.43	207.18
2. Operator's labor earnings	$ 56.61	92.16	111.42	110.31	104.27	88.61
3. Farm labor earnings	$ 57.22	94.47	116.61	118.54	108.10	91.74
4. Family earnings	$113.37	212.20	347.20	459.71	495.58	256.20
5. Family earnings per adult-male unit	$ 40.09	59.23	80.18	100.57	94.70	68.66
6. Labor returns	$ 60.12	126.51	197.53	251.55	273.33	144.64
7. Labor returns per man-equivalent	$145.37	155.66	160.63	148.11	131.06	151.48
8*						
9. Net profits per crop mow	$ 2.49	2.44	2.24	1.65	1.46	2.27
10. Income from other than farm sources	$ 15.87	21.96	49.29	126.19	106.89	47.08
Size of business:						
11. Farm area	6.6	14.5	23.6	34.4	48.0	18.3
12. Crop area	5.9	13.3	20.8	29.8	36.6	15.9
13. Crop mow	10.5	24.0	37.6	53.1	63.9	28.5
14. Man-work units	56.5	131.9	207.1	296.1	349.7	156.6
15. Man-equivalent	0.43	0.90	1.26	1.81	2.22	1.01
16. Animal-work units	13.6	21.8	32.8	47.5	58.3	32.5
17. Index of double cropping	179.	180.	181.	178.	172.	179.
18. Size of family (adult-male units)	2.8	3.6	4.3	4.6	5.2	3.7
19. Farm capital	$544.71	1205.01	1900.09	2645.60	3329.14	1442.98
20. Farm receipts per mow	$ 22.80	24.29	24.83	24.38	24.04	24.27
21. Farm expenses per mow	$ 5.64	9.94	11.90	13.29	13.82	11.23
Labor efficiency:						
22. Man-work units per man equivalent	139.2	157.9	170.1	169.7	164.6	156.7
23. Crop mow per man equivalent	26.0	28.8	31.0	30.2	29.8	28.7
24. Animal-work units per labor animal unit	11.9	17.5	23.7	30.7	35.0	23.6
25. Crop mow per labor animal unit	13.2	19.8	27.2	34.3	38.3	26.7
26. Value of family and hired labor per crop mow	$ 0.24	1.28	2.09	2.42	2.44	1.78
Quality of business:						
27. Crop index	96.	95.	101.	103.	104.	100.
28. Land value per mow	$ 45.91	47.26	47.00	46.37	40.71	46.32
Capital efficiency:						
29. Capital per mow in buildings	$ 28.86	22.39	20.50	17.99	18.25	21.03
30. Capital per mow in implements	$ 1.81	4.35	3.90	3.83	2.99	3.63
31. Interest on capital investment per mow	$ 7.42	7.25	7.32	7.11	7.27	7.26

*Variable number 8 was purposely deleted after the type was set.

TABLE 18. RELATION OF SIZE OF FARM TO 30 VARIABLES

2866 farms, 17 localities, seven provinces, China (1921-1925)

Variables	Average of each variable for specified size of farm group (farm area)			
	Small	Medium	Large	All farms
Profits:				
1. Farm earnings	$105.91	214.98	438.63	239.60
2. Operator's labor earnings	$ 51.48	80.73	139.75	87.42
3. Farm labor earnings	$ 51.05	92.11	162.44	98.06
4. Family earnings	$146.26	251.51	483.93	278.48
5. Family earnings per adult-male unit	$ 45.38	59.99	85.85	65.51
6. Labor returns	$ 91.11	162.88	317.95	181.06
7. Labor returns per man-equivalent	$ 69.80	85.58	97.43	83.92
8*				
9. Net profits per crop hectare	$ −2.78	15.19	21.29	11.85
10. Income from other than farm sources	$ 23.56	29.72	58.00	34.08
Size of business:				
11. Farm area (hectares)	0.96	2.47	5.66	2.34
12. Crop area (hectares)	0.93	2.37	5.41	2.72
13. Crop mow (hectares)	1.35	3.40	7.63	3.86
14. Man-work units	111.5	243.7	519.2	275.3
15. Man-equivalent	1.42	2.14	3.55	2.29
16. Animal-work units	29.5	70.4	156.0	90.1
17. Index of double cropping	150.	148.	144.	147.
18. Size of family (adult-male units)	3.0	4.2	5.9	4.3
19. Farm capital	$685.85	1535.76	3452.40	1769.29
20. Farm receipts per hectare	221.26	196.58	171.66	183.45
21. Farm expenses per hectare	71.12	67.80	66.00	65.15
Labor efficiency:				
22. Man-work units per man-equivalent	84.1	119.8	156.2	119.4
23. Crop hectare per man-equivalent	1.10	1.74	2.33	1.71
24. Animal-work units per labor animal unit	36.3	59.1	70.3	62.8
25. Crop hectare per labor animal unit	2.04	3.10	3.66	3.29
26. Value of family and hired labor per crop hectare	28.77	29.08	29.58	28.82
Quality of business:				
27. Crop index	103.	101.	100.	100.
28. Land value per hectare	626.00	623.00	612.00	620.00
Capital efficiency:				
29. Capital per hectare in buildings	181.99	142.25	113.00	127.96
30. Capital per hectare in implements	24.31	27.39	21.00	23.45
31. Interest on capital investment per hectare	73.82	71.06	66.31	68.24

*Variable number 8 was purposely deleted after the type was set.

APPENDIX II

TABLE 1. GROSS CORRELATION COEFFICIENTS CLASSIFIED ACCORDING TO SIZE (FROM TABLES 2-7)

2866 farms, 17 localities, seven provinces, China (1921-1925)

Factors	Less than .3		.3 and less than .5		.5 and less than .7		.7 and less than .9		.9 and over		Average of coefficients of the same sign
	Low		Moderate		Marked		High		Very close		
	Plus	Minus	Plus	Minus	Plus	Minus	Plus	Minus	Plus	Minus	
Operator's labor earnings correlated with											
Net profits per crop mow	1	...	6	...	6	...	4	...	...	...	+.534
Crop mow	5	1	4	...	3	...	2	1	1	...	+.433
Man-work units	4	2	4	...	3	...	2	1	1	...	+.469
Man equivalent	5	5	3	...	2	...	1	1	...	...	+.374
Index of double cropping	10	5	1	...	...	...	...	...	...	...	+.161
Man-work units per man-equivalent	3	...	8	1	4	...	1	...	...	...	+.448
Crop mow per man	3	...	10	1	2	...	1	...	...	...	+.409
Crop index	8	2	4	...	3	...	...	...	...	...	+.317
Land value (farm area)	3	10	3	...	...	1	...	...	...	...	−.177
Size of family (adult-male unit)	8	4	2	...	1	1	...	...	...	...	+.252
Crop mow correlated with											
Man-equivalent	...	...	...	...	3	...	12	...	2	...	+.787
Index of double cropping	9	4	...	3	...	...	...	...	...	...	+.158
Man-work units per man-equivalent	1	...	4	...	9	...	2	...	1	...	+.587
Crop mow per man-equivalent	2	...	1	...	10	...	4	...	...	...	+.602
Crop index	11	3	...	2	...	1	...	...	...	...	+.112
Size of family (adult-male units)	1	...	4	...	8	...	3	...	...	...	+.541
Labor returns correlated with											
Net profits per crop mow	4	...	7	...	5	...	1	...	...	...	+.420
Man-work units	...	...	...	...	6	1	8	...	2	...	+.776
Man-work units per man-equivalent	2	...	5	1	9	...	...	...	...	...	+.478
Crop mow per man-equivalent	2	...	3	1	10	...	1	...	...	...	+.482
Labor returns per man-equivalent correlated with											
Man-work units per man-equivalent	...	1	6	...	7	...	3	...	...	...	+.568
Crop mow per man-equivalent	1	1	7	...	5	...	3	...	...	...	+.540
Crop index	8	2	4	...	3	...	...	...	...	...	+.311
Net profits per crop mow correlated with											
Crop mow	11	2	3	...	...	...	...	...	...	...	+.223
Man-work units	12	1	3	...	...	...	1	...	...	...	+.227
Man-equivalent	9	6	1	...	...	...	1	...	...	...	+.220
Man-work units per man-equivalent	3	...	9	...	4	...	1	...	...	...	+.405
Crop mow per man-equivalent	8	1	2	1	4	...	1	...	...	...	+.367
Crop index	10	1	4	...	2	...	...	...	...	...	+.247
Size of family (adult-male units)	9	4	3	...	...	...	...	...	...	...	+.182
Size of family correlated with											
Family earnings	1	...	5	...	6	...	4	...	...	...	+.539
Man-equivalent	1	...	2	...	8	...	5	...	...	...	+.600
Crop mow per man-equivalent correlated with											
Man-work units per man-equivalent	...	...	1	...	2	...	6	...	8	...	+.835
Man equivalent correlated with											
Crop index	9	7	1	...	...	...	...	...	...	...	+.147

TABLE 2. GROSS CORRELATION COEFFICIENTS OF CROP MOW, REPRESENTING SIZE OF BUSINESS, AND OTHER VARIABLES PERTAINING TO SIZE OF BUSINESS, LABOR EFFICIENCY AND QUALITY OF BUSINESS*

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Crop mow correlated with		
	Size of business variables		
	Man-equivalent	Index of double cropping	Size of family (adult-male units)
North China			
Anhwei			
Hwaiyuan	+.837±.018	+.099±.060	+.691±.032
Su	+.734±.018	—.045±.040	+.512±.029
Chihli			
Pingsiang	+.701±.028	+.141±0.54	+.634±.033
Yenshan (1922)	+.757±.023	—.076±.055	+.730±.026
Yenshan (1923)	+.823±.019	+.139±.057	+.542±.041
Honan			
Sincheng	+.620±.035	—.146±.055	+.492±.043
Kaifeng	+.890±.011	—.045±.055	+.611±.035
Shansi			
Wusiang	+.517±.031	+.238±.040	+.388±.036
Wutai	+.769±.018	...	...
Average by localities	*+.739*	*+.154*	*+.575*
East Central China			
Anhwei			
Laian (1921)	+.698±.034	—.346±.059	+.293±.061
Laian (1922)	+.835±.020	—.319±.061	+.596±.044
Wuhu	+.968±.042	+.277±.062	+.717±.032
Chekiang			
Chinhai	+.936±.010	+.219±.078	+.300±.075
Fukien			
Lienkiang	+.838±.016	+.010±.053	+.334±.047
Kiangsu			
Kiangning (S)	+.767±.019	+.230±.045	+.504±.035
Kiangning (T)	+.801±.016	—.301±.042	+.740±.024
Wuchin	+.892±.008	+.072±.039	+.564±.027
Average by localities	*+.842*	*+.162*	*+.506*
Average by 17 localities	*+.787*	*+.158*	*+.541*

*Average in tables 2-7 are for coefficients of the same sign.

TABLE 2.—*(Continued)*

Provinces and hsiens in which studies were made	Crop mow correlated with		
	Labor efficiency variables		Quality of business variable
	Man-work units per man-equivalent	Crop mow per man-equivalent	Crop index
North China			
Anhwei			
Hwaiyuan	+.655±.035	+.718±.029	+.023±.061
Su	+.493±.030	+.719±.019	—.530±.029
Chihli			
Pingsiang	+.640±.032	+.587±.036	+.114±.054
Yenshan (1922)	+.544±.039	+.576±.037	—.129±.054
Yenshan (1923)	+.647±.034	+.655±.033	+.241±.055
Honan			
Sincheng	+.633±.034	+.642±.033	—.137±.055
Kaifeng	+.669±.031	+.559±.038	—.305±.050
Shansi			
Wusiang	+.394±.036	+.647±.025	+.117±.042
Wutai	+.984±.001	+.887±.010	—.079±.045
Average by localities	*+.629*	*+.666*	*+.124*
East Central China			
Anhwei			
Laian (1921)	+.643±.039	+.580±.045	+.115±.066
Laian (1922)	+.776±.027	+.887±.014	—.355±.059
Wuhu	+.644±.039	+.632±.040	+.143±.065
Chekiang			
Chinhai	+.463±.065	+.605±.052	+.060±.082
Fukien			
Lienkiang	+.710±.026	+.692±.028	+.129±.052
Kiangsu			
Kiangning (S)	+.051±.047	+.330±.042	+.063±.047
Kiangning (T)	+.421±.038	+.263±.043	+.003±.046
Wuchin	+.613±.024	+.263±.036	+.227±.037
Average by localities	*+.540*	*+.532*	*+.106*
Average by 17 localities	*+.587*	*+.602*	*+.112*

TABLE 3. GROSS CORRELATION COEFFICIENTS OF OPERATOR'S LABOR EARNINGS AND VARIABLES PERTAINING TO SIZE OF BUSINESS, LABOR EFFICIENCY, QUALITY OF BUSINESS AND NET PROFITS PER CROP MOW

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Operator's labor earnings correlated with			
	Size of business variables			
	Crop mow	Man-equivalent	Man-work units	Index of double cropping
North China				
Anhwei				
Hwaiyuan	+.117±.060	+.489±.046	—.224±.058	+.164±.059
Su	+.374±.034	—.134±.039	+.422±.033	—.193±.038
Chihli				
Pingsiang	+.045±.055	—.071±.054	+.099±.054	+.289±.050
Yenshan (1922)	+.441±.044	+.059±.055	+.434±.045	+.134±.054
Yenshan (1923)	—.819±.019	—.777±.023	—.829±.018	—.047±.058
Honan				
Sincheng	+.618±.035	+.127±.055	+.627±.034	—.042±.056
Kaifeng	+.904±.010	+.719±.027	+.904±.010	—.032±.055
Shansi				
Wusiang	+.099±.042	—.017±.043	+.104±.042	+.173±.041
Wutai	+.471±.035	+.219±.043	+.438±.036	...
Average by localities	*+.384*	*+.323*	*+.433*	*+.190*
East Central China				
Anhwei				
Laian (1921)	+.140±.066	—.191±.065	+.126±.066	+.010±.067
Laian (1922)	+.540±.053	+.491±.051	+.562±.046	—.070±.067
Wuhu	+.325±.060	+.194±.064	+.319±.060	+.209±.064
Chekiang				
Chinhai	+.584±.054	+.404±.069	+.613±.051	+.442±.066
Fukien				
Lienkiang	+.858±.014	+.625±.032	+.867±.013	+.006±.053
Kiangsu				
Kiangning (S)	+.717±.023	+.695±.024	+.756±.020	+.176±.046
Kiangning (T)	—.059±.046	—.213±.044	—.053±.046	+.154±.045
Wuchin	+.257±.036	+.094±.039	+.299±.035	+.019±.039
Average by localities	*+.489*	*+.417*	*+.506*	*+.145*
Average by 17 localities	*+.433*	*+.374*	*+.469*	*+.161*

TABLE 3.—*(Continued)*

Provinces and hsiens in which studies were made	Operator's labor earnings correlated with		
	Size of business variables	Labor efficiency variables	
	Size of family (adult-male units)	Crop mow per man	Man-work units per man-equivalent
North China			
Anhwei			
Hwaiyuan	+.014±.061	+.422±.050	+.412±.050
Su	+.166±.039	+.463±.031	+.438±.032
Chihli			
Pingsiang	—.052±.055	+.213±.052	+.364±.047
Yenshan (1922)	+.056±.055	+.469±.043	+.462±.043
Yenshan (1923)	—.539±.042	—.395±.049	—.383±.050
Honan			
Sincheng	—.023±.056	+.628±.034	+.643±.033
Kaifeng	+.596±.036	+.715±.027	+.678±.030
Shansi			
Wusiang	+.191±.041	+.367±.037	+.231±.040
Wutai	...	+.496±.034	+.494±.034
Average by localities	*+.205*	*+.472*	*+.465*
East Central China			
Anhwei			
Laian (1921)	—.013±.067	+.465±.053	+.521±.049
Laian (1922)	+.280±.062	+.387±.057	+.416±.056
Wuhu	+.221±.064	+.393±.056	+.346±.059
Chekiang			
Chinhai	+.185±.080	+.559±.057	+.724±.039
Fukien			
Lienkiang	+.356±.046	+.423±.044	+.630±.032
Kiangsu			
Kiangning (S)	+.412±.039	+.129±.047	+.173±.046
Kiangning (T)	—.293±.042	+.075±.046	+.226±.043
Wuchin	+.290±.036	+.337±.034	+.415±.032
Average by localities	*+.291*	*+.346*	*+.431*
Average by 17 localities	*+.252*	*+.409*	*+.448*

TABLE 3.—*(Continued)*

Provinces and hsiens in which studies were made	Operator's labor earnings correlated with		
	Quality of business variables		Net profits per crop mow
	Crop index	Land value (farm area)	
North China			
Anhwei			
Hwaiyuan	+.167±.059	—.029±.061	+.350±.053
Su	+.166±.039	—.114±.039	+.472±.031
Chihli			
Pingsiang	+.326±.049	+.325±.049	+.410±.046
Yenshan (1922)	+.128±.054	—.052±.055	+.569±.037
Yenshan (1923)	—.193±.056	—.277±.054	+.017±.058
Honan			
Sincheng	—.062±.056	—.198±.054	+.629±.034
Kaifeng	+.540±.039	—.562±.038	+.654±.032
Shansi			
Wusiang	+.164±.041	—.054±.042	+.568±.029
Wutai	+.241±.042	—.167±.044	+.581±.030
Average by localities	*+.247*	*—.182*	*+.472*
East Central China			
Anhwei			
Laian (1921)	+.600±.043	—.020±.067	+.864±.017
Laian (1922)	+.095±.067	+.002±.068	+.357±.059
Wuhu	+.230±.063	—.214±.064	+.535±.048
Chekiang			
Chinhai	+.408±.069	—.261±.077	+.807±.029
Fukien			
Lienkiang	+.294±.049	+.381±.045	+.400±.045
Kiangsu			
Kiangning (S)	+.488±.036	+.194±.046	+.315±.043
Kiangning (T)	+.571±.031	+.127±.045	+.772±.019
Wuchin	+.330±.035	+.337±.034	+.783±.015
Average by localities	*+.377*	*—.165*	*+.604*
Average by 17 localities	*+.317*	*—.177*	*+.534*

TABLE 4. GROSS CORRELATION COEFFICIENTS OF LABOR RETURNS AND VARIABLES PERTAINING TO NET PROFITS PER CROP MOW, SIZE OF BUSINESS, AND LABOR EFFICIENCY

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	LABOR RETURNS CORRELATED WITH			
	Net profits per crop mow	Size of business variables	Labor efficiency variables	
		Man-work units	Man-work units per man-equivalent	Crop mow per man-equivalent
North China				
Anhwei				
Hwaiyuan	+.437±.049	+.824±.019	+.616±.038	+.671±.033
Su	+.396±.034	+.684±.021	+.455±.032	+.528±.029
Chihli				
Pingsiang	+.026±.055	+.541±.039	+.517±.040	+.328±.049
Yenshan (1922) ..	+.238±.052	+.850±.015	+.490±.042	+.507±.041
Yenshan (1923) ..	+.086±.058	+.591±.038	—.349±.051	—.359±.051
Honan				
Sincheng	+.518±.041	+.836±.017	+.523±.041	+.525±.041
Kaifeng	+.358±.048	+.898±.011	+.580±.037	+.556±.038
Shansi				
Wusiang	+.547±.030	+.739±.019	+.368±.037	+.558±.029
Wutai	+.683±.024	+.679±.024	+.673±.025	+.690±.024
Average by localities	*+.365*	*+.765*	*+.528*	*+.545*
East Central China				
Anhwei				
Laian (1921) ..	+.729±.031	+.658±.038	+.499±.050	+.445±.054
Laian (1922) ..	+.471±.053	+.825±.022	+.597±.043	+.678±.036
Wuhu	+.445±.054	+.857±.018	+.570±.045	+.582±.044
Chekiang				
Chinhai	+.483±.063	+.914±.014	+.550±.057	+.502±.062
Fukien				
Lienkiang	+.386±.045	+.901±.010	+.547±.037	+.705±.027
Kiangsu				
Kiangning (S) ..	+.126±.047	+.899±.009	+.085±.047	+.126±.047
Kiangning (T) ..	+.609±.029	+.634±.027	+.193±.044	+.001±.046
Wuchin	+.605±.025	+.683±.021	+.377±.033	+.309±.035
Average by localities	*+.482*	*+.796*	*+.427*	*+.419*
Average by 17 localities	*+.420*	*+.776*	*+.478*	*+.482*

TABLE 5. GROSS CORRELATION COEFFICIENTS OF LABOR RETURNS PER MAN-EQUIVALENT REPRESENTING PROFITS AND OTHER VARIABLES PERTAINING TO LABOR EFFICIENCY AND CROP INDEX

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Labor returns per man-equivalent correlated with		
	Labor efficiency variables		Quality of business variable
	Man-work units per man-equivalent	Crop mow per man-equivalent	Crop index
North China			
Anhwei			
Hwaiyuan	+.732±.028	+.775±.024	+.251±.057
Su	+.600±.026	+.317±.036	+.300±.036
Chihli			
Pingsiang	+.701±.028	+.531±.039	+.414±.045
Yenshan (1922)	+.688±.029	+.685±.029	+.267±.051
Yenshan (1923)	—.277±.054	—.271±.054	—.027±.058
Honan			
Sincheng	+.776±.022	+.764±.023	—.059±.056
Kaifeng	+.397±.047	+.726±.026	+.034±.055
Shansi			
Wusiang	+.471±.033	+.671±.023	+.034±.055
Wutai	+.334±.040	+.419±.037	+.274±.042
Average by localities	*+.587*	*+.611*	*+.254*
East Central China			
Anhwei			
Laian (1921)	+.442±.054	+.488±.051	+.604±.043
Laian (1922)	+.531±.048	+.490±.051	+.143±.066
Wuhu	+.425±.055	+.490±.051	+.125±.066
Chekiang			
Chinhai	+.665±.046	+.365±.071	+.179±.080
Fukien			
Lienkiang	+.678±.029	+.649±.036	+.404±.045
Kiangsu			
Kiangning (S)	+.632±.028	+.296±.043	+.576±.032
Kiangning (T)	+.436±.037	+.460±.036	+.539±.032
Wuchin	+.585±.026	+.507±.029	+.325±.035
Average by localities	*+.549*	*+.468*	*+.362*
Average by 17 localities	*+.568*	*+.540*	*+.311*

TABLE 6. GROSS CORRELATION COEFFICIENTS OF NET PROFITS PER CROP MOW AND VARIABLES PERTAINING TO SIZE OF BUSINESS, LABOR EFFICIENCY AND QUALITY OF BUSINESS

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	Net profits per crop mow correlated with			
	Size of business variables			
	Crop mow	Man-work units	Man-equivalent	Size of family (adult-male unit)
North China				
Anhwei				
Hwaiyuan	+.406±.051	+.396±.051	+.257±.057	+.216±.058
Su	+.015±.040	+.070±.040	—.123±.039	+.034±.040
Chihli				
Pingsiang	+.237±.052	+.266±.051	+.786±.021	+.262±.051
Yenshan (1922) ..	+.087±.055	+.083±.055	—.077±.055	—.031±.055
Yenshan (1923) ..	+.103±.058	+.100±.058	+.019±.058	+.059±.058
Honan				
Sincheng	+.147±.055	+.168±.055	—.100±.056	—.062±.055
Kaifeng	+.056±.055	+.039±.055	+.014±.055	+.097±.055
Shansi				
Wusiang	+.336±.038	+.327±.038	+.077±.042	+.371±.037
Wutai	+.743±.020	+.732±.021	+.499±.034	...
Average by localities	+.237	+.242	+.275	+.173
East Central China				
Anhwei				
Laian (1921) ..	+.248±.063	+.228±.064	—.127±.066	+.088±.067
Laian (1922) ..	+.428±.055	+.391±.057	+.288±.062	+.362±.059
Wuhu	+.285±.061	+.284±.061	+.219±.064	+.227±.063
Chekiang				
Chinhai	+.093±.082	+.215±.079	+.029±.082	+.064±.082
Fukien				
Lienkiang	+.137±.052	+.133±.052	+.063±.053	+.324±.048
Kiangsu				
Kiangning (S) ..	—.268±.044	—.074±.047	—.146±.046	—.123±.047
Kiangning (T) ..	+.017±.046	+.178±.044	+.164±.044	—.038±.046
Wuchin	—.033±.039	+.024±.039	—.144±.038	+.074±.039
Average by localities	+.201	+.208	+.153	+.190
Average by 17 localities	+.223	+.227	+.220	+.182

TABLE 6.—*(Continued)*

Provinces and hsiens in which studies were made	Net profits per crop mow correlated with		
	Labor efficiency variables		Quality of business variables
	Man-work units per man-equivalent	Crop mow per man-equivalent	Crop index
North China			
Anhwei			
Hwaiyuan	+.526±.044	+.575±.041	+.079±.060
Su	+.503±.030	+.218±.038	+.223±.038
Chihli			
Pingsiang	+.448±.044	+.277±.051	+.154±.053
Yenshan (1922)	+.330±.049	+.311±.050	+.299±.050
Yenshan (1923)	+.131±.057	+.142±.057	+.066±.058
Honan			
Sincheng	+.326±.050	+.298±.051	+.132±.055
Kaifeng	+.018±.055	+.197±.053	+.216±.053
Shansi			
Wusiang	+.404±.036	+.584±.028	+.103±.042
Wutai	+.789±.017	+.852±.012	+.350±.039
Average by localities	*+.386*	*+.384*	*+.180*
East Central China			
Anhwei			
Laian (1921)	+.558±.046	+.539±.048	+.575±.045
Laian (1922)	+.442±.054	+.517±.049	—.185±.065
Wuhu	+.460±.053	—.253±.063	+.082±.066
Chekiang			
Chinhai	+.694±.053	+.188±.079	+.087±.082
Fukien			
Lienkiang	+.219±.051	+.205±.051	+.408±.044
Kiangsu			
Kiangning (S)	+.336±.042	—.375±.041	+.329±.042
Kiangning (T)	+.400±.038	+.314±.041	+.529±.033
Wuchin	+.404±.033	+.291±.036	+.322±.035
Average by localities	*+.427*	*+.342*	*+.333*
Average by 17 localities	*+.405*	*+.367*	*+.247*

TABLE 7. GROSS CORRELATION COEFFICIENTS OF A NUMBER OF VARIABLES

2866 farms, 17 localities, seven provinces, China (1921-1925)

PROVINCES AND HSIENS IN WHICH STUDIES WERE MADE	Man-equivalent correlated with	Size of family (adult-male unit correlated with)		Crop mow per man-equivalent correlated with
	Crop index	Family earnings	Man-equivalent	Man-work units per man-equivalent
North China				
Anhwei				
Hwaiyuan	+.037±.061	+.706±.030	+.704±.031	+.959±.005
Su	—.213±.038	+.376±.034	+.578±.027	+.796±.015
Chihli				
Pingsiang	+.055±.055	+.566±.037	+.642±.032	+.866±.014
Yenshan (1922) ..	—.211±.053	+.633±.033	+.714±.027	+.990±.001
Yenshan (1923) ..	+.203±.056	+.651±.034	+.527±.042	+.982±.002
Honan				
Sincheng	—.180±.054	+.513±.041	+.817±.019	+.997±.001
Kaifeng	—.267±.051	+.794±.020	+.681±.030	+.988±.001
Shansi				
Wusiang	+.162±.041	+.385±.036	+.395±.036	+.610±.027
Wutai	+.120±.044	...	...	+.967±.003
Average by localities	*+.115*	*+.578*	*+.632*	*+.906*
East Central China				
Anhwei				
Laian (1921) ..	—.219±.064	+.513±.049	+.626±.041	+.748±.030
Laian (1922) ..	—.155±.066	+.530±.049	+.538±.048	+.824±.022
Wuhu	+.096±.066	+.813±.023	+.764±.028	+.368±.058
Chekiang				
Chinhai	—.037±.082	+.180±.080	+.222±.078	+.835±.025
Fukien				
Lienkiang	+.190±.051	+.398±.045	+.383±.045	+.987±.001
Kiangsu				
Kiangning (S) ..	+.125±.047	+.321±.042	+.564±.032	+.527±.034
Kiangning (T) ..	+.132±.045	+.743±.021	+.871±.011	+.812±.016
Wuchin	+.346±.034	+.495±.029	+.572±.026	+.949±.004
Average by localities	*+.178*	*+.499*	*+.568*	*+.756*
Average by 17 localities	*+.147*	*+.539*	*+.600*	*+.835*

APPENDIX III

TABLE 1. TOTAL AMOUNT OF CROP HECTARES DEVOTED TO VARIOUS CROPS*

2866 farms, 17 localities, seven provinces, China (1921-1925)

Provinces and hsiens in which studies were made	First or second crop harvested from the same piece of ground during one growing season.	Seeds: Grains: Wheat	Rice	Kaoliang	Millet	Barley	Corn	Glutinous rice	Legumes intertilled with grains: Corn and soybeans	Legumes: Soybeans	Green beans
North China											
Anhwei											
Hwaiyuan	1st	221.87	30.67	93.34	3.21	39.65	...	...	...	...	...
	2nd	...	156.01	...	...	...	...	...	...	19.69	15.92
Su	1st	432.67	...	229.01	31.40	212.85	...	...	...	...	...
	2nd	...	...	...	0.43	...	...	...	...	486.52	159.42
Chihli											
Pingsiang	1st	44.77	...	31.28	10.63	1.97	...	...	...	1.44	...
	2nd	...	...	...	28.72	...	...	...	...	...	...
Yenshan (1922) ..	1st	151.63	...	83.53	37.95	...	...	...	...	...	...
	2nd	...	...	...	...	...	32.86	...	51.75	46.26	2.50
Yenshan (1923) ..	1st	254.02	...	128.60	58.07	...	...	...	...	...	...
	2nd	...	...	...	...	...	48.12	...	40.06	31.65	1.61
Honan											
Sincheng	1st	286.70	...	68.14	11.16	43.41	0.70	...	...	...	...
	2nd	...	...	...	88.22	...	55.02	...	...	11.16	22.25
Kaifeng	1st	301.92	...	65.82	48.96	41.85	...	...	...	...	...
	2nd	...	...	...	...	...	11.00	...	28.44	29.69	110.74
Shansi											
Wusiang	1st	114.82	...	10.80	159.15	8.66	...	...	...	3.06	2.80
	2nd	...	...	...	...	...	...	...	...	...	...
Wutai	1st	157.78	...	316.25	332.20	...	...	...	...	99.56	12.29
	2nd	...	...	...	...	...	...	...	...	...	...
Total	1st	*1966.18*	*30.67*	*1026.77*	*692.73*	*348.39*	*0.70*	...	...	*104.06*	*15.09*
	2nd	...	*156.01*	...	*117.37*	...	*147.00*	...	*120.25*	*624.97*	*312.44*
East Central China											
Anhwei											
Laian (1921) ..	1st	59.48	218.40	...	...	4.80	8.77	13.02	...	...	...
	2nd	...	31.62	...	...	...	...	...	16.00	11.37	11.31
Laian (1922) ..	1st	125.53	101.20	...	...	7.95	2.04	...	...	...	...
	2nd	...	36.86	...	...	...	...	2.43	...	13.08	25.49
Wuhu	1st	15.65	32.95	...	...	1.89	...	...	...	...	...
	2nd	...	128.53	...	...	...	...	4.72	...	...	...
Chekiang											
Chinhai	1st	1.83	55.87	...	...	...	...	...	...	...	...
	2nd	...	1.77	...	...	...	...	4.09	...	0.69	...
Fukien											
Lienkiang	1st	13.47	82.49	...	...	...	...	...	...	...	...
	2nd	...	16.58	...	...	...	...	...	...	...	...
Kiangsu											
Kiangning (S) ..	1st	375.78	3.13	...	...	3.28	...	...	...	...	...
	2nd	...	360.45	...	...	...	...	10.73	...	33.61	6.19
Kiangning (T) ..	1st	155.67	16.36	...	...	73.71	...	1.22	...	...	...
	2nd	...	161.18	...	...	...	2.62	1.77	25.64	65.76	...
Wuchin	1st	199.63	10.30	...	...	6.50	...	18.47	...	...	...
	2nd	...	266.84	...	...	...	...	...	...	0.49	...
Total	1st	*946.99*	*520.70*	...	...	*93.13*	*10.81*	*32.71*	...	...	...
	2nd	...	*1003.33*	...	...	...	*2.62*	*23.74*	*41.64*	*125.00*	*42.99*
Total, 17 localities ..	2nd	*2913.17*	*1159.34*	...	*117.37*	...	*149.62*	*23.74*	*161.89*	*749.97*	*355.43*
	1st	...	*551.37*	*1026.77*	*692.73*	*446.52*	*11.51*	*32.71*	...	*104.06*	*15.09*

(Continued)

APPENDIX III TABLE 1.—*(Continued)*

Provinces and hsiens in which studies were made	First or second crop harvested from the same piece of ground during one growing season.	Seeds				Tubers	Fibers		Vegetables	Fruits	Other Crops	Total crop hectares
		Legumes		Oil seeds								
		Field peas	Soybeans (black)	Sesame	Rapeseed	Sweet potatoes	Cotton	Hemp				
North China												
Anhwei												
Hwaiyuan	1st	...	...	...	0.48	1.52	10.37	1.75	1.53	0.32	25.05	—
	2nd	...	...	41.67	...	25.76	...	...	...	...	4.45	693.26
Su	1st	121.11	...	...	...	...	24.95	8.61	1.42	...	214.87	—
	2nd	...	11.46	56.01	...	59.57	0.32	0.16	0.28	1.66	10.54	2063.26
Chihli												
Pingsiang	1st	...	8.63	...	...	...	...	...	10.18	...	41.27	—
	2nd	...	...	...	...	...	...	4.98	...	...	0.17	184.04
Yenshan (1922)	1st	...	...	...	...	...	...	...	0.44	1.45	1.94	—
	2nd	...	1.05	...	...	0.16	...	...	...	...	11.22	422.74
Yenshan (1923)	1st	...	...	...	...	...	...	...	1.09	...	2.24	—
	2nd	...	55.55	...	...	...	...	...	...	...	31.85	652.86
Honan												
Sincheng	1st	1.12	...	...	...	...	...	...	0.31	15.69	4.63	—
	2nd	...	58.44	14.23	...	31.84	...	...	...	...	20.79	733.81
Kaifeng	1st	1.04	...	0.12	...	...	10.00	5.11	4.90	...	...	—
	2nd	...	...	21.91	...	41.44	...	...	0.78	2.47	88.27	814.46
Shansi												
Wusiang	1st	...	...	...	4.23	...	0.13	8.66	1.04	2.51	145.14	—
	2nd	...	...	...	...	...	...	...	...	...	18.84	479.84
Wutai	1st	39.48	...	...	...	...	...	9.74	...	...	880.28	—
	2nd	...	...	...	...	...	...	...	...	...	...	1847.58
Total	1st	*162.75*	*8.63*	*0.12*	*4.71*	*1.52*	*45.45*	*33.87*	*20.91*	*19.97*	*1315.42*	—
	2nd	...	*126.50*	*133.82*	...	*158.77*	*0.32*	*5.14*	*1.06*	*4.13*	*186.13*	*7891.85*
East Central China												
Anhwei												
Laian (1921)	1st	...	...	...	1.55	...	8.83	2.65	8.28	0.22	74.33	—
	2nd	...	...	3.20	...	0.55	...	...	...	...	0.33	474.71
Laian (1922)	1st	3.37	...	...	3.92	...	1.05	0.44	7.67	...	...	—
	2nd	...	...	0.77	...	0.17	...	...	...	...	...	331.97
Wuhu	1st	...	...	...	108.83	...	...	...	...	...	10.05	—
	2nd	...	...	...	...	...	...	...	...	...	...	302.62
Chekiang												
Chinhai	1st	0.70	...	...	0.94	...	16.98	...	1.60	3.63	5.73	—
	2nd	...	...	...	...	2.04	...	...	...	...	1.72	97.59
Fukien												
Lienkiang	1st	...	...	...	3.19	61.59	...	0.96	0.17	...	0.66	—
	2nd	...	...	...	...	0.73	...	0.47	3.56	...	0.17	184.04
Kiangsu												
Kiangning (S)	1st	...	...	...	...	...	0.82	...	4.62	...	40.32	—
	2nd	...	...	5.07	...	0.60	...	...	...	0.15	1.79	846.49
Kiangning (T)	1st	21.95	...	...	...	0.99	...	...	1.07	0.32	198.56	—
	2nd	...	...	1.10	...	0.60	0.43	...	0.30	0.24	3.89	733.38
Wuchin	1st	2.46	...	0.68	1.37	...	...	...	...	...	103.99	—
	2nd	...	...	...	...	...	...	...	0.47	...	3.28	613.98
Total	1st	*28.48*	...	*0.68*	*119.80*	*62.53*	*27.63*	*4.05*	*23.41*	*4.17*	*433.64*	—
	2nd	...	...	*10.14*	...	*4.69*	*0.43*	*0.47*	*4.33*	*0.39*	*11.18*	*3584.78*
Total, 17 localities	1st	*191.23*	*8.63*	*0.80*	*124.51*	*64.10*	*73.13*	*37.92*	*44.32*	*24.14*	*1749.06*	—
	2nd	...	*126.50*	*143.96*	...	*163.46*	*0.75*	*5.61*	*5.39*	*4.52*	*197.31*	*11476.63*

(Continued)

APPENDIX III TABLE 1.—*(Continued)*

*The following crops are listed separately because they are found only in one or at most a few regions. The numerals in parentheses indicate whether the crop is a first or a second crop. The double dagger indicates that the crop has been omitted from the total crop hectare, area.

In some cases the totals of this table vary slightly from those in table 3, chapter III because of additions or omissions of third decimal figures in both tables.

HWAIYUAN:	Wheat and field peas, 23.29 (1); sesame and small beans, 2.24 (2); sesame and soybeans, 1.84 (2); Indigo, 0.96 (1); peanuts, 0.70 (1); carrots, 0.07 (2); tobacco, 0.06 (1); miscellaneous, 0.04 (1); 0.30 (2); trees for shade, lumber, or fuel, 0.01 (1)‡.
SU:	Field peas and wheat, 201.92 (1); peanuts, 3.63 (1), 1.42 (2); carrots, 1.66 (2); others, 0.67 (1), 0.59 (2); Irish potatoes, 0.55 (2); red turnips, 0.28 (1); miscellaneous, 8.37 (1); 6.32 (2); shade, lumber, or fuel, 0.01 (1)‡.
PINGSIANG:	Kaoliang and soybeans (black), 41.24 (1); indigo, 0.16 (2); miscellaneous, 0.03 (1), 0.01 (2).
YENSHAN (1922):	Soybeans and millet, 8.72 (2); kaoliang and millet, 1.94 (1); miscellaneous, 2.50 (2).
YENSHAN (1923):	Proso millet, 9.89 (2); soybeans and millet, 6.54 (2); china jute, 1.57 (1); others, 0.67 (1); carrots, 0.04 (2); miscellaneous, 15.38 (2); fruits, 0.06 (1)‡; shade, lumber, or fuel, 0.01 (1)‡.
SINCHENG:	Buckwheat, 19.53 (2); peanuts, 2.82 (1); sesame and green beans, 1.81 (1); 0.35 (2); miscellaneous, 0.91 (2).
KAIFENG:	Proso millet, 35.43 (2); sesame and green beans, 34.88 (2); red beans, 17.96 (2).
WUSIANG:	Kaoliang and green beans, 110.26 (1); buckwheat, 17.77 (2); squash and potatoes, 13.73 (1); proso millet, 6.54 (1); others, 1.07 (2); Irish potatoes, 0.65 (1); miscellaneous, 13.96 (1).
WUTAI:	Oats, 441.32 (1); Proso millet, 324.07 (1); Irish potatoes, 114.27 (1); miscellaneous, 0.62 (1).
LAIAN (1921):	Field peas and wheat, 73.50 (1); miscellaneous, 0.83 (1), 0.33 (2).
WUHU:	Field peas and wheat, 9.17 (1); miscellaneous, 0.88 (1).
CHINHAI:	Broad beans, 4.45 (1); taro, 1.72 (2); miscellaneous, 1.28 (1).
LIENKIANG:	Taro, 0.51 (1), 0.17 (2); miscellaneous, 0.15 (1).
KIANGNING (S):	Barley hulless, 38.23 (1); red beans, 1.64 (2); miscellaneous, 2.09 (1), 0.15 (2).
KIANGNING (T):	Broad beans, 13.33 (1); sesame and green beans, 1.31 (2); *astragalus sinensis*, 0.73 (1); turnips, 0.12 (2); taro, 0.01 (1); miscellaneous, 0.37 (1), 2.46 (2); mulberry, 20.18 (1); shade, lumber, or fuel, 159.39 (1); fruits, 4.55 (1).
WUCHIN:	*Astragalus sinensis*, 27.62 (1); broad beans, 21.27 (1); wheat and field peas, 12.79 (1); melon and soybeans, 2.69 (2); taro, 0.86 (1); arrow-head, 0.59 (2); trees for shade, lumber, or fuel, 0.45 (1); fruits, 0.07 (1); mulberry, 40.86 (1); miscellaneous, 0.07 (1).

APPENDIX IV

A RECORD OF A YEAR'S FARM BUSINESS

This record is used for calculating the annual labor earnings and analyzing the yearly farm business and has been prepared by the Department of Farm Management and Rural Economics, University of Nanking, College of Agriculture and Forestry, Nanking, China.

Farm number ( ) Land tenure; Owner, part owner, tenant, manager

Name of the operator_____ Province_____ Hsien_____ Village_____

Record for the year beginning_____ and ending_____

Name of the investigator_____ Address_____

LAND[1]

KIND OF LAND[2]	Class of land	Land mortgaged by the operator†			Land owned by the operator			Land rented by the operator		
		Number of mow	Value per mow	Total value	Number of mow	Value per mow	Total value	Number of mow	Mortgaged value per mow	Total value
	Good									
	Medium									
	Poor									
Total										

[1] Of the above reported cultivated land how many mow are in graves,_____; dykes,_____; ponds,_____; roads and paths,_____.

If trees are too few to record in terms of mow give the number of the following trees: Common trees, _____; bamboos, _____; mulberry, _____; fruits, _____; tea,_____; tung oil,_____; other,_____.

[2] Itemize kind of land in detail as follows or by other local classification:

Cultivated: dry, paddy, low, in trees (other than fruit), etc.:

Uncultivated: farmstead, hill, marshland, grave land not included under cultivated, in trees (other than fruit), etc.)

*This schedule, as printed, includes various changes made during the years the studies were made. The items but not the exact arrangement are those used in Chinese for field work.

†Mortgaging is explained in Chapter III in the second paragraph under the topic of distribution of capital.

CAPITAL (SUMMARY)*

ITEMS	Operator's		Landlord's		Operator's and landlord's	
	Beginning of year	End of year	Beginning of year	End of year	Beginning of year	End of year
Land						
Land mortgaged from others						
Deposit on rented land and buildings						
Trees						
Buildings (farm)						
Farm tools						
Feed and seeds						
Other supplies						
Livestock						
Total capital						
Average capital						
Capital increase						
Capital decrease						

*Notes:—

(1) Land value in the beginning and at the end of year should be the same unless it is improved.

(2) Trees should include all the total value of the kinds mentioned below the table on land.

(3) The livestock value must be taken from the table on livestock.

(4) Care must be taken to distinguish between items of capital belonging to the operator and those belonging to the landlord.

OPERATOR'S LIVESTOCK

KIND		Beginning of the year			End of the year			Purchased			Sold			Used by the operator's family			Produced			Number dying during year
		Number	Value per head	Total value	Number	Value per head	Total value	Number	Price per head	Total value	Number	Price per head	Total value	Number	Price per head	Total value	Number	Value at end of year	Total value at end of year	
Horses	M*																			
	Y*																			
Water buffaloes	M																			
	Y																			
Yellow cows	M																			
	Y																			
Donkeys	M																			
	Y																			
Mules	M																			
	Y																			
Sheep	M																			
	Y																			
Goats	M																			
	Y																			
Pigs	M																			
	Y																			
Chickens	M																			
	Y																			
Ducks	M																			
	Y																			
Geese	M																			
	Y																			
Honey bees																				
Fish																				
Other:	M																			
	Y																			
Total																				

*M stands for mature animal. *Y stands for young animal.

OPERATOR'S CROPS*

Kind of crop	Per cent of a normal crop	Total crops grown			Crops sold, given away or to be sold by operator*			Used by the operator's family			Rent to the landlord			Used by animals			Used for seed		
		Mow	Yield per mow	Total value	Amount	Price	Total value	Amount	Value per unit	Total value	Amount	Value per unit	Total value	Amount	Value per unit	Total value	Amount	Value	Total value
1. Rice																			
2. Glutinous																			
3. Buckwheat																			
4. Cotton																			
5. Sugar cane																			
6. Corn and soybeans																			
7. Sesame and soybeans																			
8. Peanuts																			
9. Kaoliang																			
10. Millet																			
11. Tobacco																			
12. Irish potatoes																			
13. Sweet potatoes																			
14. Hemp																			
15. Vegetables																			
16. Taro																			
17. Watermelons and																			
18. Broad beans																			
19. Rape																			
20. Wheat																			
21. Barley																			
22.																			
23.																			
24.																			
Total																			

*(1) Crops to be sold should not be counted as used by the operator's family, and the amount of crops for presents or for payment of debts should go to crops sold. (2) When two crops are grown together and the product harvested separately give the yield of each separately. (3) Indicate the unit of weight or measure by D for tan, P for picul, T for tow, and C for catty.

Rotation number used on this farm (obtain from rotation schedule).

What per cent of the important crops raised are sold as soon as they are harvested?_____.

WEIGHTS AND MEASURES

(a) How many catties make one tow of wheat of rice?_____

(b) How many ounces make one catty?_____

(c) One mow equals how many gung?_____

(d) One gung equals how many feet?_____

(e) Cut a string or strip of paper the exact length of the foot and attach to this schedule.

OPERATOR'S MISCELLANEOUS RECEIPTS

Items [1]	Sold to be sold, or given away by the operator			Used by the operator's family			As rent to landlord			As feed		
	Amount	Value	Total value	Amount	Value	Total value	Amount	Value	Total value	Amount	Value	Total value
Crop stalks:												
1												
2												
Pond products:												
1												
2												
3												
Nut trees:												
1												
2												
Fruits:												
1												
2												
3												
Trees:												
1												
2												
3												
Bamboo 2												
Fuel (Grass)												
Mulberry seedlings												
Tea leaves												
Mulberry leaves 2												
Man 3 (No. of days_____) labor (Rate)												
Animal (No. of days_____) labor (Rate)												
Hire for implements												
Products from home industry 4												
Total												

[1] Give kinds.

[2] If a main crop include under crops.

[3] Include only work done by members of the household. Do not include work done by absent members of the family. Work done for long periods of a month or more should be entered under income from other than farm sources.

[4] If the home industry is performed by the persons on the farm or if it has close relation to the farm business, then such income should be entered here, otherwise, it should be entered under the other income of the operator.

OPERATOR'S LIVESTOCK BY-PRODUCTS

Kind	Sold, to be sold, or given away by the operator			Used by the operator's family		
	Amount	Value	Total value	Amount	Value	Total value
Eggs (Chicken .. .. / Duck .. .. / Goose .. ..)						
Manure				x	x	x
Hides and skins						
Feathers						
Bones						
Meat						
Honey						
Raw Silk						
Cocoons						
Total						

INCOME FROM OTHER THAN FARM SOURCES

Source	Place where the work was done	Member of household by whom the work was done	Number of months engaged in the work	Net income from such work
Labor (Kind:)				
Home industry (Kind:)	x			
Rent of land (number of mow)	x	x	x	
Rent of buildings (number of rooms	x	x		
Investment (Kind:)		x	(Interest rate:)	
Physician				
Trading				
Teaching				
Total net income				

FARM EXPENSES (OPERATOR)

Items	Number of persons	Amount of time spent in farm work (months, days)	Total months boarded during working period	Cost (or value)		Total cost
				Wages	Board	
Family labor(1):						
Operator(2)						
Man						
Woman						
Child						
Hired labor:						
Year						
Day						
Child						

Items	Amount	Total cost	Feed: Kind	Amount	Value per unit	Total cost
Other hired labor costs:			**Feed:**			
Kind:			Kind			
Hats						
Towels						
Tobacco						
Liquor and wine						
Other:						
Cash rent (No. of mow)			**Fertilizer:**			
Hire of labor animals (No. of days)			Kind			
Repair of buildings						
Repair of farm equipment						
Silkworm eggs						
Mulberry leaves						
Seeds purchased						
Seedlings						
Land taxes						
Other taxes			*Total expenses*		x	
Other expenses						

FARM EXPENSES (LANDLORD)

Items	Total cost
Seeds	
Land taxes	
Repair of buildings	
Repair of farm equipment	
Collection of rent	
Others	

Fertilizer: Kind	Amount	Cost per unit	Total cost
Total expenses			

APPENDIX IV

SUMMARY

FARM RECEIPTS

ITEMS	Operator's	Landlord's	Operator's and landlord's
Crops sold			
Rent (landlord's)			
Livestock and livestock products			
Miscellaneous			
Capital increase			
Used by the family			
Total receipts			

FARM EXPENSES

ITEMS	Operator's	Landlord's	Operator's and landlord's
Livestock purchased			
Farm expenses			
Capital decrease			
Total expenses			
Farm earnings			
Interest at 8% per annum ..	x		
Labor earnings			

GENERAL INFORMATION

FARM LAYOUT

(1) How many plots of land_____
(2) What is the distance of the fartherest plot of land away from the operator's farm buildings?_____
(3) What is the average distance of land away from the operator's farm building?_____
(4) What is the size of the largest plot of land in mow?_____
(5) What is the size of the smallest piece of land in mow?_____

OPERATOR'S HISTORY

A. From the year when the operator is able to read or work on the farm to the year when he became an operator.

AGE	PLACE	OCCUPATION				
		Studying:	Wandering:	Helping farm	Hired labor	Other

OPERATOR'S HISTORY

B. From the year beginning as operator until present.

Age	Place	Land (in mow) for each year of change														
		Amount of land acquired by									Amount of land in the farm diminished by					
		Inheritance	Purchase	Renting from others	Land from expired leases to others	Mortgaging land from others	Mortgaged land redeemed	Land from river deposits	Gifts	Total	Sale	Renting to others	Rented land released	Mortgaging to others	Mortgaged land released	Total

OPERATOR'S HOUSEHOLD EXPENSES

KIND	Value	Food	Amount	Value
1. Local cult practices		1. Oil for cooking		
2. Church contributions		2. Salt		
3. Police fees		3. Sauce		
4. Charity		4. Vinegar		
5. Social demands		5. Coal, fuel, charcoal		
6. New Year holidays		6. Rice		
7. Education		7. Wheat		
8. Medical		8. Kaoliang		
9. Tobacco and cigarettes		9. Beans		
10. Opium		10. Corn		
11. Gambling		11. Millet		
12. Clothing (raw material)		12. Tea leaves		
13. Clothing (ready made)		13. Wine		
14. Processions		14. Fish		
15. Weddings		15. Meat		
16. Funerals		16. Chickens, geese, ducks		
17. Furniture		17. Eggs		
18. Ornaments		18. Vegetables		
19. Lawsuits		19. Fruits		
20. Servants		20. Sugar		
21. Oil for light		21. Refreshment		
22. Other		22. Other		
23.		23.		
		24.		
		25.		
Total		*Total*		

OPERATOR'S HOUSEHOLD AND ABSENT MEMBERS OF FAMILY*
(include infants)

HOUSEHOLD					ABSENT MEMBERS OF THE FAMILY				
					Living where				
Relation to operator	Age	No. of years education	No. of winters education	Occupation	Province	Hsien	Village	Occupation	Amount of money given to operator

*The amount of money given to the operator by the absent members should be transferred to the other income of the operator.

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